Official Journal of
The American Radio
Relay League

QST

devoted entirely to

AMATEUR RADIO

August 1998

$1-

QST reviews:

- **Yaesu FT-847** HF/VHF/UHF transceiver
- **ICOM IC-T8A** three-band H-T

New Ham Companion:
Practical information for all hams

St. Paul's Island —CY9AA

1998 Hamvention Highlights

Build this Spectrum Analyzer!

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VHF & UHF

HANDHELDS

IC-T2A
2 Meter Single Bander • 4.5 W • Rugged Aluminum Chassis & Polycarbonate Case • Built-In Tone Squelch with Pocket Beep and Tone Scan • 8 Programmable Keys • 43 Memory Channels • Uses 8 "AA" Ni-Cd (included) or Alkaline Batteries • Affordable • 2.3"(W), 5.5"(H), 1.3"(D), 10.9 oz

IC-T22A/IC-T42A (2M/440 MHz)
Single Bander • Fun, Shirt Pocket Small and Easy to Use • Large Alphanumeric Display • Wide Receive Coverage, Including Air Band • 5 W @ 13.5 V (3 W Out of Box) • Air Band Receive • 80 Memory Channels (40 w/Alpha Display) • 2.3"(W), 4.3"(H), 1.1"(D), 10.9 oz

IC-T7AHP
2 Meter/440 MHz Dual Bander • Dual Bands at a Single Bander Size & Price • Very Easy to Use–No Function Key • Works One Band at a Time, Switch Between Bands with One Touch of the Band Key • Now 4 W (2M)/3 W (440) Out of the Box with BP-173 • "Intuitive" Help Display • CTCSS Encode/Decode• Very Affordable • 2.5"(W), 4.8"(H), 1.1"(D), 11.3 oz

IC-Q7A
2 Meter/440 MHz Dual Bander • Extended Rx 30-1300 MHz (cellular blocked), Airband Receive Broadcast FM and AM Receive (most TV stations, too) • 300 Mw Transmitter • 200 Memories • Uses "AA" Alkaline or Ni-Cd Batteries • Rugged Construction • Tone Squelch • Easy to Use • Splash Resistant • 6-25 KHz Channel Step • Full Scanning Capability • Receiver Attenuator • Power Save Feature • 2.3"(W), 3.4"(H), 0.98"(D)
(Shown with optional antenna)

IC-W32A
2 Meter/440 MHz Dual Bander • 5 W Out of the Box • No Function Key • PC Programmable • 200 Memories with Alphanumeric Display, Messaging & Paging • "Intuitive" Help Display • Backlit Display and Keypad • Wide Band RX (Including Air Band) • V/V, V/U, U/U Operation with VHF/UHF Tuning Knob Exchange • Encode/Decode • PC/Radio-to-Radio Cloning • 2.2"(W), 4.9"(H), 1.2"(D), 12.0 oz

IC-T8A
6 Meter/2 Meter/440 MHz Tri Bander Handheld • Worlds Smallest! • Super Thin Profile/Lightweight Design • Up to 5 Watts Power on All Bands (13.5 V DC) • 4.5 Watts Out of Box with Supplied BP-200 Battery • One-Touch Band Switching • Ni-MH Powered! • RX (MHz): 50-54 (6 meters), 118 - 174 (2 meters), 400 - 470 (440 MHz) Broadcast FM and AM Receive (most TV stations, too) • Airband Receive • 123 Memory Channels with 10 Scan Edges and 1 Call for Each Band • MIL SPEC 810 C/D/E • Tone Squelch with Pocket Beep • Backlit Display with Timer • Built in Guide Function • JIS Grade 4 Water Resistance • Wall Charger Included • DTMF Encoder with 9 DTMF Memories • Handheld to Handheld Cloning Capability or PC Programming Capability** • 2.3 (W), 4.3 (H), 1.2 (D), 9.9 oz

MOBILES

IC-2100H

Optional Infrared Wireless Mic

*The HM-90 infrared optional wireless mic works with the new IC-2100H, IC-207H** and the more advanced IC-2710H. Enjoy cable-free operation on the GO!*

2 Meter • 55/10/5 Watts (selectable) • TX 144-148 MHz • RX 136-174 MHz† • 75 db/93 db IMD • 113 Memory Channels • Heavy Duty, One Piece, Die Cast Aluminum Chassis • MIL SPEC 810 C/D/E Shock/Vibration • Front Panel Programmable Alphanumeric Display • PC or Radio to Radio Cloning** • DTMF Microphone (HM-98S) • CTCSS Encode/Decode Standard – 50 Tone Frequencies • Independently Programmable Tx/Rx • Tone Scan • Auto Repeater with Busy Lockout • Priority Watch (3 types) • 5.5"(W) x 1.6"(H) x 7.1"(D), 2 lb 10 oz

IC-2710H

2M/440 MHz Advanced Dual Bander • 2M (50 W)/440 MHz (35 W) • Detachable Control Panel** • Fast Scanning • 220 Memory Channels • PC Programmable • CTCSS Encode (decode optional) • RF Attenuator • 8 DTMF Memory Switches • v/v, u/u Simultaneous RX • Built-In Duplexer • 3 Selectable Power Levels: 50 (35), 10, 5 • 5.5"(W), 1.6"(H), 8.4"(D), 3.1 lb

IC-207H

2M/440MHz Dual Bander • 2M (45 W)/440 MHz (35 W) • Super Compact Detachable Control Panel** with Big Keys, Big Knobs and a Big Display • Work One Band at a Time • 9600 Baud Ready • Wide Band RX (Includes Air Band) • CTCSS Encode/Decode • Very Affordable • 5.5"(W), 1.6"(H), 8.1"(D), 2.6 lb

BASE STATIONS

IC-821H 2M/440 MHz Advanced Satellite & Digital Base Station • All Modes • Easy to Use! • Continuous Adjustable Transmit Power • Sub Band Transmit • 9600 Full Compatibility Out of the Box • 160 Memories • Noise Blanker & IF Shift on Main & Sub Bands (independent main/sub RX) • Built-In Electronic Keyer • Satellite Tracking with Doppler Correction • Compact! 9.5"(W), 3.7"(H), 9.4"(D), 11.0 lb

"By far the easiest to use satellite radio on the market today. In less than 10 minutes after unpacking the 821H, I was on the air at 9600 baud with KO-23"

– Michael Wyrick, N4USI, AO-27
Control Operator

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ICOM is giving away one IC-706MKII each month, between April 1998 and March 1999. For complete details, visit your authorized ICOM dealer today.

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ICOM IC-Q7A

Get Higher Performance in a Pocket Size Dual Bander for a Lower Price!

SIMPLICITY
Large tuning knob, speaker mic jack and SMA antenna. Perfect for fun on the go!

MORE WIDE BAND RECEPTION Hear what you've been missing. The 'Q7A receives from 30 to 1300 MHz*. You'll get more police, fire, special emergency and other types of government activity, more business bands, and more ham bands (6 meter and 1.2 GHz!). **BETTER AUDIO OUTPUT** The 'Q7A sports a large, 36mm (1.4 in) diameter speaker. Sounds are loud and crisp thanks to 100 mW of audio output. A triple conversion superheterodyne receiver improves overall performance. **LESS STRAIN ON YOUR WALLET** If you're looking for solid performance in a pocket size, the 'Q7A is your radio.

*Cellular frequencies blocked

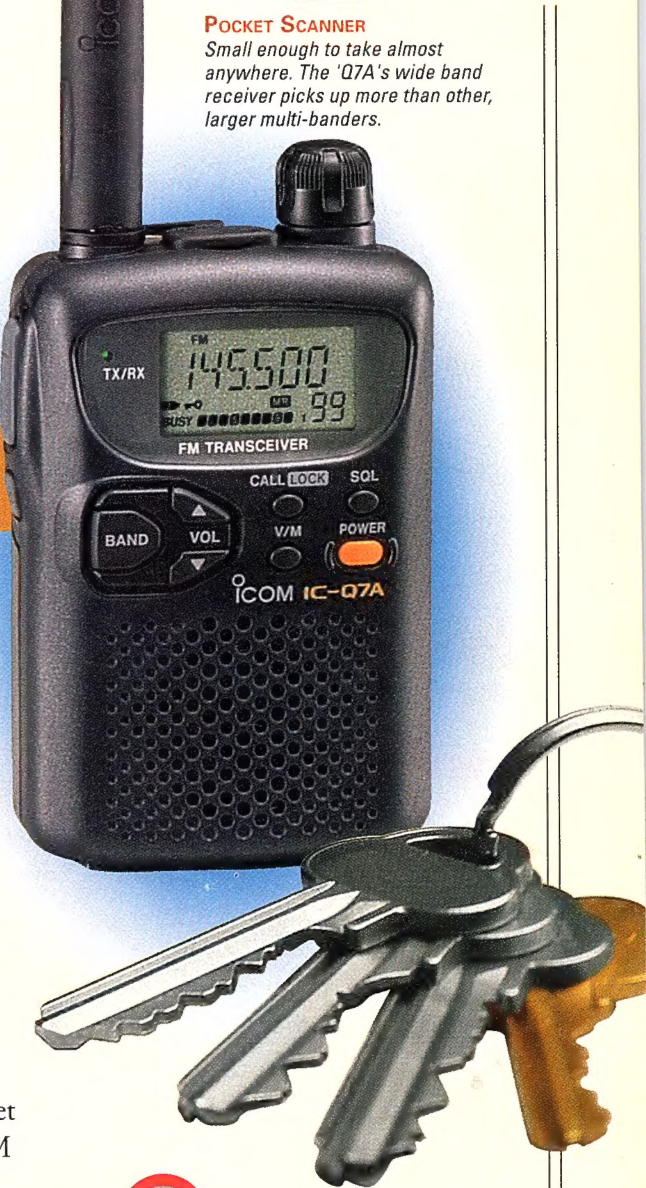
POCKET SCANNER
Small enough to take almost anywhere. The 'Q7A's wide band receiver picks up more than other, larger multi-banders.

SPECIFICATIONS

Transmit	144-148, 440-450 MHz
Receive	30-1309.995 MHz*
The 'Q7A is a dual bander ham radio and a wide band RX scanner all in one!	
Mode	FM, AM (WFM Rx)
Power	350 mW (VHF), 300 mW (UHF) @ 3.0 V DC
Memory Channels	200 total
2 banks of 100 memory channels include 10 edge scan channels & 2 call channels	
Size	2.3(W) x 3.75(H) x 1.1(D) in. 58(W) x 86(H) x 27(D) mm.
Weight	6 oz / 170 g

FEATURES

- **Superior Audio**
  - 100 mW audio output
- **Superior Receive System**
  - Triple conversion superheterodyne
- **Built to Military Specifications (MIL STD) 810 C/D/E Shock/Vibration**
- **One-Touch Band Selection**
  - Work one band at a time
- **CTCSS Encode/Decode (Tone Squelch)**
  - Fully adjustable, with pocket beep
  - 50 distinct encode frequencies
- **CTCSS Tone Scan**
- **Dual Watch**
- **Auto Repeater**
- **Numerous Scan Modes**
  - including 3 priority scan modes
- **10 Tuning Steps**
- **RIT Function**
  - for 1.2 GHz flexibility
- **Auto Power OFF and Power Saver**
- **Easy Reverse**
- **Backlit LCD Display**



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Total power control! Use either the supplied AA Ni-Cds or slip in a couple of alkalines. If you're on the road and your batteries run out of juice, fresh replacements are just a convenience store away.

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ICOM

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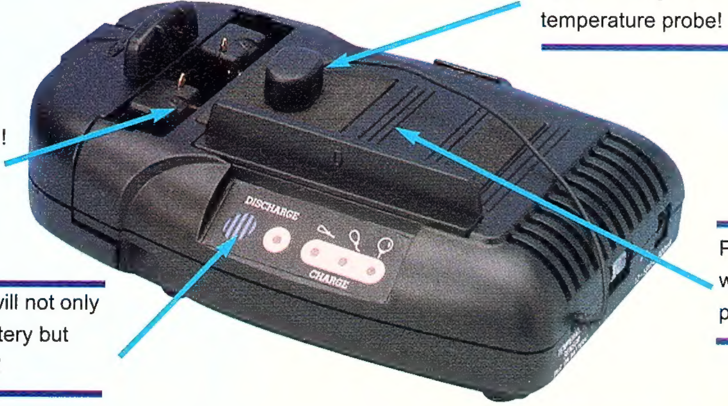

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1000mAh

MH-BP-180
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QST

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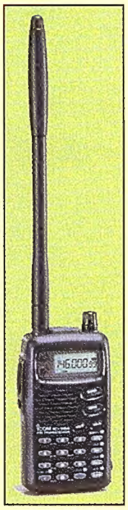
Technical

35 A Spectrum Analyzer for the Radio Amateur
Wes Hayward, W7ZOI, and Terry White, K7TAU
Build the ultimate radio workbench tool!

44 Build a Portable Antenna *Robert H. Johns, W3JIP*
80 through 2 meter coverage with an antenna that installs almost anywhere.

64 Product Review *Rick Lindquist, N1RL*
Two rigs share the spotlight this month: the Yaesu FT-847 HF/VHF/UHF transceiver and the ICOM T-8 multiband H-T.


64

28

News and Features

9 "It Seems to Us. . .": Two Who Made a Difference

15 DC Currents *Steve Mansfield, N1MZA*
Support for spectrum bill grows even as "Intelligent Highway" interests target 5 GHz band.

28 High Adventure on St. Paul's Island—The CY9AA DXpedition
Dennis Motschenbacher, K7BV
The storm-swept rock was barely habitable and, some say, even *haunted.* But three intrepid hams decided to make it their DX haven!

32 A Dayton 1998 Pictorial *Rick Lindquist, N1RL*
QST takes you on a photographic tour of the largest hamfest on the planet!

47 The Radio Amateurs of FYR Macedonia *George Pataki, WB2AQC*
Experience Amateur Radio from a Balkan perspective.

50 Thanks, Barry *David Greer, N4KZ*
A personal encounter with K7UGA.

76 Happenings *Rick Lindquist, N1RL*
Barry Goldwater, K7UGA, Silent Key; Phase 3D won't fly this year; many comment on LMCC petition; nominees sought for ARRL Board of Directors; more!

New Ham Companion

52 The Doctor is IN
The true nature of arcing; FM receiver limiting; attaching BNC connectors, more!

54 Operation White Rock, NA-187 *Norman Wilson, N6JV*
Hams will do anything to put an island on the air!

57 Flea Market Madness! A Beginner's Guide to Buying and Selling
Tips to make you a shrewd hamfest wheeler-dealer. *Kirk Kleinschmidt, NT0Z*

60 A PTT Repeater Box You Can Build *Dave Miller, NZ9E*
Expand your PTT (push-to-talk) and use it to trigger up to seven devices at once.

63 Test Your Knowledge! *H. Ward Silver, N0AX*
If you've become comfortable with multiple-choice tests, watch out!

60

103

Operating

100 1998 ARRL RTTY Roundup Results *Billy Lunt, KR1R*

103 1998 ARRL September VHF QSO Party Rules

104 Get Ready, Get SET, Go! *Steve Ewald, WV1X*
Plan now for the 1998 ARRL Simulated Emergency Test.

Departments

Amateur Radio World 93
Amateur Satellites 96
Contest Corral 105
Coming Conventions 97
Correspondence 24
Digital Dimension 92
FM & Repeaters 94
Ham Ads 152
Hamfest Calendar 97
Hints and Kinks 72
How's DX? 82
Index of Advertisers 174
New Books 75
New Products 43, 56, 91, 94, 98
New Software 62
Public Service 85
Section News 107
Silent Keys 99
Special Events 106
Strays 103
Technical Correspondence 74
The World Above 50 MHz 88
This Month in Amateur Radio 26
Up Front in *QST* 19
VHF/UHF Century Club Awards 73
W1AW Schedule (see July page 106)
We're at Your Service 10
YL News 95
75, 50 and 25 Years Ago 99

QST
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Our Cover

Many hams dream of finding spectrum analyzers on their workbenches, but the cost and complexity of these devices often place them out of reach. This month we present a precision analyzer that breaks new ground for affordability and *buildability*! Read the first installment of "A Spectrum Analyzer for the Radio Amateur" in this issue.

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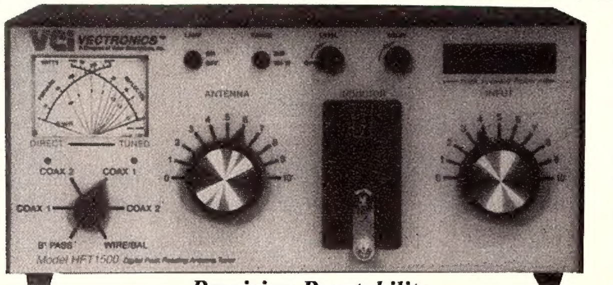
HFT-1500
$459⁹⁵



The VECTRONICS HFT-1500 is not just an antenna tuner . . . it's a beautifully crafted work of art, using the finest components available and the highest quality construction.

Every HFT-1500 aluminum cabinet is carefully crafted with a durable baked-on paint that won't scratch or chip.

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Two *heavy duty* 4.5 kV transmitting variable capacitors and a massive *high current* roller inductor gives you arc-free operation up to 2 kW PEP SSB.

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A sturdy hand cranked roller inductor lets you quickly *fly* from band to band. A precision 5-digit *gear* driven turns counter lets you accurately return to your previous settings.

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Absolute Minimum SWR

You can tune your SWR down to absolute minimum!

Why? Because *all* three matching network components, the roller inductor and both variable capacitors, are *fully* adjustable.

Tune any Antenna

You can tune any real antenna from 1.8 to 30 MHz, including all MARS and WARC bands. You can tune verticals, dipoles, inverted vees, yagis, quads, long-wires, whips, G5RVs, etc . . .

SSB✱Analyzer Bargraph™

VECTRONICS' exclusive 21 segment bargraph display lets you visually follow your instantaneous voice peaks. Has level and delay controls.

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A *shielded* directional coupler and backlit Cross-Needle meter displays *accurate* SWR, forward and reflected power simultaneously. Reads both peak and average power on 300/3000 Watt scales.

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Select two coax fed antennas (tuned or bypassed), balanced line/wire or bypass.

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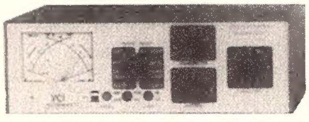
$159⁹⁵



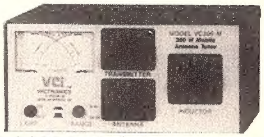
VECTRONICS uses the finest components available to build the highest quality 300 Watt antenna tuner ever made.

You can tune any antenna 1.8-30 MHz. Custom 48 position switched inductor and continuous rotation 1000 Volt capacitors provide arc-free operation. Handles 300 Watts PEP SSB, (150 Watts on 1.8 MHz).

8 position antenna switch, built-in 50 ohm dummy load, peak reading backlit cross-needle SWR Power meter, 4:1 balun for balanced line antenna. Scratch-proof Lexan front panel. 10.2x9.4x3.5 in. Weighs 3.4 lbs.

300 Watt *Mobile* Tuner

VC-300M
$109⁹⁵



The VC-300M *Mobile* Antenna Tuner is compact, lightweight, easy-to-operate and is our most economical tuner.

It's compatible with *any* mobile antenna and *any* mobile HF transceiver and is compact enough to fit in the most compact car.

It can also be used at home with dipoles, vees, verticals, beams or quads fed by coax.

Backlit dual movement meter simultaneously monitors Power and SWR. Covers 1.8-30 MHz. Handles 300 Watts SSB PEP, 200 Watts continuous, (150 Watts on 1.8 MHz.). 7.25x8.75x3.6 in. Weighs 3.4 lbs.

SWR/Power Meters

PM-30
$79⁹⁵
PM-30UV
$89⁹⁵

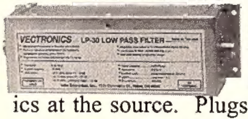
PM-30, $79.95, for 1.8 to 60 MHz. Displays forward and reflected power and SWR simultaneously on dual movement Cross-Needle Meter. True *shielded* directional coupler assures accuracy. Backlit meter displays peak or average power in 300/3000 Watt ranges. First-rate construction includes scratch-proof case/front panel. 5.3x5.75x3.5 inches. SO-239 connectors.

For 144/220/440 MHz, 30/300 Watt ranges. PM-30UV, $89.95, has SO-239 connectors. PM-30UVN, $89.95, has N connectors. PM-30UVB, $89.95, has BNC connectors.

1500 Watt *dry* Dummy Load

DL-650M, $64.95. Handles 100 watts continuous, 1500 Watts for 10 seconds to 650 MHz. Ceramic resistor. SWR < 1.3. SO-239 connector. **DL-650MN, $69.95** has N connector.

Low Pass TVI Filter



LP-30, $69.95. Eliminates TVI by attenuating harmonics at the source. Plugs between transmitter and antenna or tuner. Handles 1500 watts.

High Pass TVI Filter

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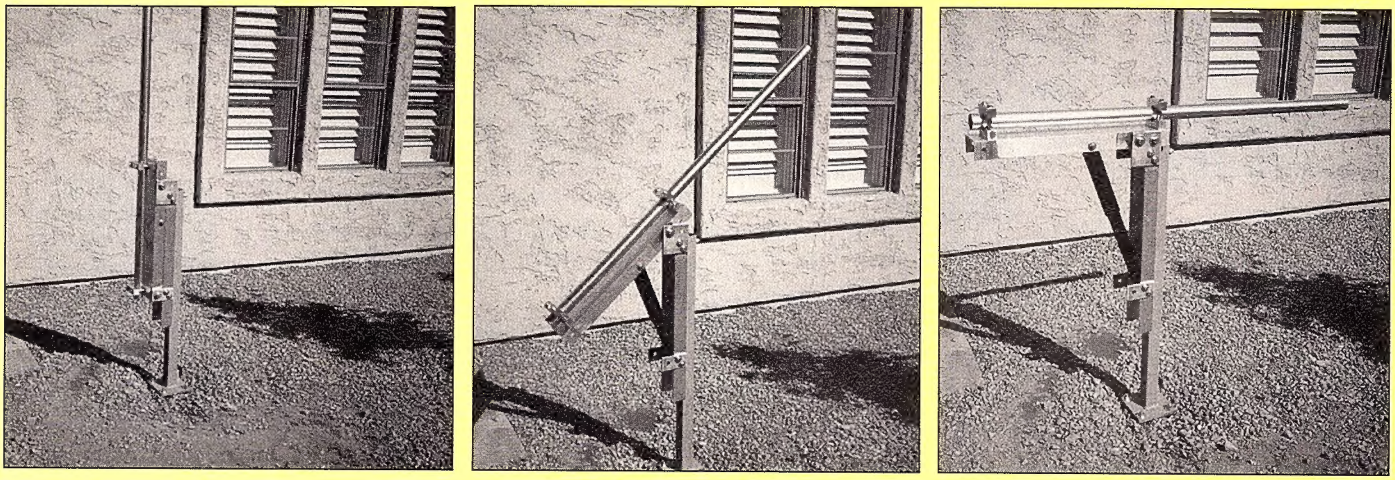

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ARRL is an incorporated association without capital stock chartered under the laws of the State of Connecticut, and is an exempt organization under Section 501(c)(3) of the Internal Revenue Code of 1986. Its affairs are governed by a Board of Directors, whose voting members are elected every two years by the general membership. The officers are elected or appointed by the directors. The League is noncommercial, and no one who could gain financially from the shaping of its affairs is eligible for membership on its Board.

"Of, by, and for the radio amateur," the ARRL numbers within its ranks the vast majority of active amateurs in the nation and has a proud history of achievement as the standard-bearer in amateur affairs.

A *bona fide* interest in Amateur Radio is the only essential qualification of membership; an Amateur Radio license is not a prerequisite, although full voting membership is granted only to licensed amateurs in the US.

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"It Seems to Us..."

Two Who Made a Difference

The history of Amateur Radio is replete with individuals whose outstanding personal qualities led them to make equally outstanding contributions to the Amateur Radio community. This month we salute two who are no longer with us, but have left extraordinary legacies for future generations.

Barry, K7UGA

The world knew him as Senator Barry M. Goldwater. Radio amateurs knew him simply as Barry, K7UGA. He liked to get on the air and chat with other hams; if asked what he did for a living, he'd say he worked for the government.

Licensed as 6BPI in his native Arizona at age 12, Barry was an avid builder and operator until he went to school in Virginia and had to leave his beloved ham station behind. In an interview broadcast on the Voice of America in 1963, Barry told Bill Leonard, W2SKE, that his greatest DX with his 20-W station was Sioux City, Iowa, and that being heard in Hawaii once, "was the crowning achievement of my young life." The day he died, May 29, 1998, an ARRL Joint Dakota/Midwest Division Convention was being held in Sioux City. No one present remembered that contact some three-quarters of a century ago, but several remembered a visit Barry had made to their city many years later, after he had gained national prominence, and how he had made sure to spend some time with the hams in the area.

Barry's interest in Amateur Radio revived while a US Senator in the early 1960s. K7UGA soon became a very well known call sign, and he became an ARRL Life Member. Running phone patches for servicemen during the Vietnam War as a member of Air Force MARS gave him great personal satisfaction; a team of operators kept the station at his home on the air virtually around the clock. For years afterward, visits to this famous station were a popular feature of ARRL conventions held in the Phoenix area.

As Senator Goldwater, Barry championed three critical pieces of legislation to amend the Communications Act on our behalf. The first, in 1964, made reciprocal operating permits possible and led to the opportunities to operate while visiting other countries that we tend to take for granted today. In 1982, after he returned to the Senate, he sponsored the sweeping changes to the Communications Act that became Public Law 97-259. A year later, he guided an amendment to permit the recovery of costs in the Volunteer Examiner program through the complex legislative process in record time.

While it can never be documented, what the government *didn't* do as a result of Barry's efforts is no doubt even more important than what it *did* do. In appreciation of his service as our protector and advocate, ARRL members funded an endowment for a $5000 scholarship in his honor in 1983. The scholarship is now administered by the ARRL Foundation.

Ethel, K4LMB

Ethel M. Smith, K4LMB, came to national prominence early in her Amateur Radio career through a letter printed in *QST*. Licensed as W7FWB in 1936, Ethel quickly saw a need for an organization to nurture and encourage female hams and wrote to *QST* to promote the idea. Not content simply to suggest work that others might do, she helped to found the Young Ladies Radio League (YLRL) and became its first president in 1939. This began a distinguished record of six decades of service to the Amateur Radio community, particularly in the Washington, DC, area, which became her home in the 1940s. The ARRL, the Foundation for Amateur Radio, and the Quarter Century Wireless Association are but a few of the many other organizations to benefit from her boundless energy. The day she died, February 5, 1997, was a day of profound sadness for all who knew her.

Those among us who were fortunate to know Ethel well felt indebted to her for her tireless devotion to Amateur Radio. She saw it differently. She felt indebted herself, for the extra dimensions that Amateur Radio had brought to her life. While her organizational work was an outstanding legacy in itself, she wanted to do more.

In 1986, with the stipulation that there be no personal publicity during her lifetime, Ethel contributed $10,000 to the ARRL to create the ARRL Exceptional Merit Stipend (EMS Fund). That the fund's abbreviation was the same as its benefactor's initials was a secret that gave her a measure of private satisfaction. After her husband Tex De Bardeleben, W4TE, predeceased her, Ethel contributed another $10,000 in 1995 and arranged for her entire estate to pass to the ARRL. She offered suggestions as to how the ARRL might use the EMS Fund for the betterment of Amateur Radio, but placed no restrictions on its use.

Ethel was far richer in friends than in personal wealth, but she invested wisely. The ARRL's audited financial statements for 1997 record the value of her bequest as more than $800,000—the largest single contribution ever made to the League.

Ethel's middle initial might well have stood for "modest." She was one of those wonderful people who, while more than deserving of the spotlight, preferred to shine it on others. Reading words of tribute such as these would have made her uncomfortable. Yet, it was also in her nature to be forgiving. She would understand that in acknowledging her generosity and our obligation to fulfill her wish that it be used for the betterment of Amateur Radio, we could do no less. *Vale*, K4LMB—*David Sumner, K1ZZ*

We're At Your Service

ARRL Headquarters is open from 8 AM to 5 PM Eastern Time, Monday through Friday, except holidays. Our address is: 225 Main St, Newington, CT 06111-1494. You can call us at 860-594-0200, or fax us at 860-594-0259.

If you have a question, try one of these Headquarters departments . . .

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If all else fails, send e-mail to **hq@arrl.org** and it will be routed to the right people or departments.

ARRL on the On-Line Services

We maintain accounts on these major on-line services and check for mail several times daily.

Service	*ARRL Address*
CompuServe	70007,3373
America Online	HQARRL1

ARRL BBS

The ARRL *Hiram* Bulletin Board System is as close as your telephone. Hiram offers more than a thousand software files for your enjoyment. You can also use Hiram to send messages to anyone at Headquarters—or to other hams who frequent the BBS. Hiram accepts up to four simultaneous connections at rates from 1200 to 28,800 baud. Fire up your modem and call 860-594-0306.

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Subject: **Info Request**

In the body of your message enter:

HELP
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QUIT

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You'll also find the ARRL on the World Wide Web at:

http://www.arrl.org/

At the ARRL Web page you'll find the latest W1AW bulletins, a hamfest calendar, exam schedules, an on-line ARRL Publications Catalog and much more. We're always adding new features to our Web page, so check it often!

Stopping by for a visit?

We offer tours of Headquarters and W1AW at 9, 10 and 11 AM, and at 1, 2 and 3 PM, Monday to Friday (except holidays). Special tour times may be arranged in advance. Bring your license and you can operate W1AW anytime between 1 and 4 PM!

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Send your Strays and Up Front materials to the *QST* Features Editor (e-mail **upfront@arrl.org**). Be sure to include your name, address and daytime telephone number.

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Just pick up the telephone and call toll free 1-800-326-3942, or send e-mail to **newham@arrl.org**. We'll provide helpful advice on obtaining your Amateur Radio license, and we'll be happy to send you our informative Prospective Ham Package.

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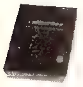

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DC Currents

By Steve Mansfield, N1MZA
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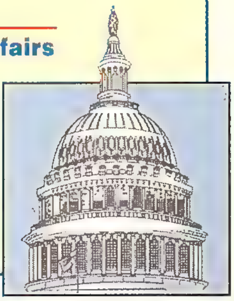

Just as radio waves aren't constrained by artificial boundaries, neither is ARRL's government relations effort. "DC Currents" covers behind-the-scenes activity you need to know about in Congress, at the FCC and other regulatory agencies, as well as at worldwide bodies such as the International Telecommunication Union.

Support for Spectrum Bill Grows, But Time Is Running Short

♦ Cards and letters from ARRL members are paying off as the Amateur Radio Spectrum Protection Act of 1998 gains support from members of the House of Representatives. The bill, HR.3572, would amend the Communications Act to prohibit the FCC from making any reallocation of the Amateur Radio Service frequency bands without providing equivalent replacement spectrum.

As we go to press, HR.3572 has 39 cosponsors (including the original sponsor, Michael Bilirakis (R-FL-9th) with several more indicating they are prepared to sign-on. A new "Dear Colleague" letter from Representative Michael Bilirakis (R-FL-9th) may help stimulate more interest on the Hill.

However, as the House focuses its attention to the 13 big budget bills necessary to keep the government running after October 1, the possibility of action on the comparatively small Spectrum Act becomes increasingly remote. As a result, it is important to gain cosponsors in order to demonstrate that the bill has wide bipartisan support in the increasingly likely event we must seek reintroduction early in the next session of Congress.

HR.3572 was introduced more than a year into the two-year session of the 105th Congress, and as a result began life facing an uphill battle against the calendar. Even under the best of circumstances, important legislation can take many years to pass. According to an expert from the Congressional Research Service, nearly 10,000 bills are introduced each session of Congress, but only about 400 or so pass by the end of the session. ARRL members are encouraged to write their members of Congress to urge them to cosponsor HR.3572. A sample letter, a backgrounder and other information can be found on the ARRL Web site at **http://www.arrl.org/govrelations/hr3572.html**.

Rep. Bilirakis Urges Colleagues to "Sign Up"

The following is a "dear colleague" letter distributed in June on Capitol Hill by Representative Michael Bilirakis, who introduced HR.3572 on behalf of ARRL. A "dear colleague" letter is a personal communication (usually seeking support for legislation) from one member of Congress to his or her colleagues. We have deleted the staff name and phone number.

Dear Colleague:

I invite you to join me as a co-sponsor of HR.3572, the Amateur Radio Spectrum Protection Act. This measure will help protect the amount of radio spectrum allocated to the Amateur Radio Service.

Organized volunteer radio amateurs, or "hams," step forward to provide emergency communication services when regular channels are disrupted by disaster. When hurricanes, earthquakes, tornadoes and other catastrophes affect civilian populations, amateur radio is often the first contact with the outside area. These trained volunteers work at their own expense and often at considerable risk to themselves.

Licensed amateur radio is entirely non-commercial. In fact, individual amateur operators are prohibited from receiving any form of payment for the volunteer work they do. These services have included helping authorities to reestablish communication after Hurricane Andrew devastated my state, helping to spot tornado touchdowns in the Midwest, monitoring flooding along the Mississippi and relaying "health and welfare" messages after a California earthquake. Amateur operators also participate in regular organized exercises to assure that messages will go through if disaster strikes.

In addition to emergency communication, amateur operators use their spectrum allocations to experiment with and develop new circuitry and techniques for increasing the effectiveness of the radio spectrum for all Americans. Much of the electronic technology we now take for granted has at least a part of its heritage in Amateur Radio experimentation.

The Balanced Budget Act of 1997 requires the FCC to conduct spectrum auctions to raise new revenues. Some of that revenue may come from the auction of current amateur radio spectrum. HR.3572 simply requires the FCC to provide the Amateur Radio Service with equivalent replacement spectrum if it reallocates and auctions any of the Services current spectrum.

As the "telecommunications revolution" continues, we must ensure that the distinguished record of service by amateur operators is not pushed aside by short-term interests. HR.3572 will provide some measure of protection, while also maintaining the flexibility the Federal Communications Commission requires to manage the nation's telecommunications infrastructure effectively.

This is an opportunity to show the more than 650,000 licensed radio amateurs in the US that you support HR.3572. If you would like to cosponsor my bill please contact (staff name, phone number).

Sincerely yours,

Michael Bilirakis
Member of Congress

Amateur Radio Spectrum Protection Act Cosponsors (in order of sign-on)

Michael Bilirakis (R-FL-9th) original sponsor
Ron Klink (D-PA-4th) original cosponsor
Peter DeFazio (D-OR-4th)
George Nethercutt (R-WA-5th)
Charlie Norwood (R-GA-10th)
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Jon Christensen (R-NE-2nd)

FCC Proposes Tightening Scanner Rules

♦ In a Notice of Proposed Rulemaking released June 3, the FCC has proposed tightening the rules governing scanning receivers to require manufacturers to make tuning and control circuitry on scanning receivers "completely inaccessible." The notice says that attempts to modify such a receiver would "likely render the equipment inoperable." The notice also proposes requiring that scanning receivers cannot receive cellular phone communication even when tuned to frequencies outside the cellular telephone bands, for example, by receiving an image frequency. The proposed rulemaking is a response to a Petition for Rulemaking (RM 9022) filed by Uniden America Corporation, which manufactures both cellular phones and scanners.

Unlike the Wireless Privacy Enhancement Act (HR.2369) that created such controversy last year by restricting access to certain frequencies, these regulatory changes, if approved, would appear only to affect certain aspects of hardware design. The notice points out that it's already illegal to modify receivers imported or manufactured prior to the effective date of the current scanning receiver rules. (Those rules became effective April 26, 1994.) The FCC has invited comments on whether it should modify its definition of a scanning receiver to include units that can be manually tuned, or which automatically switch among fewer than four frequencies.

The FCC notice suggests covering control and tuning circuits of scanning receivers with epoxy or some other substance, or encasing them in a nonremovable metal compartment, to make them impossible to access and modify. The Commission also proposes banning the import or manufacture of scanning receiver and converter kits capable of receiving cellular frequencies. Test equipment would be exempted from the definition of a scanning receiver. The notice proposes amending the rules to make it clear that modification of scanning receivers on a substantial scale to receive cellular frequencies would be the same as manufacturing, which already is illegal.

The FCC wants to require that scanners provide at least 38 dB of rejection for cellular band image frequencies. The FCC proposes that scanners be unable to receive a signal level of 5 mV/meter or less in the cell band at any tunable frequency.

While the applicability to amateur gear is not entirely clear, ARRL is looking into how requiring tuning units to be sealed will affect the ability of amateurs to experiment with circuitry, as well as the impact of new definitions of scanning receivers and test equipment. It is also not clear whether the proposed 38 dB image rejection level will add to the manufacturing cost of new gear.

The FCC has opened a 30-day comment window. The complete petition, ET Docket 98-76, is available at the FCC Web site at **http://www.fcc.gov/oet/dockets/et98-76/**.

FCC Proposes Allocating Portion of 5 GHz Amateur Band to "Intelligent Transportation"

♦ In a Notice of Proposed Rulemaking released June 11, the FCC has proposed allocating 5.850 to 5.925 GHz for use by new intelligent transportation systems (ITS) designed to provide short range, wireless links between vehicles and highway roadside communications systems. The Amateur Service has a secondary allocation at 5.650 to 5.925 GHz with government radar systems and nongovernment fixed satellite service uplinks. The proposed rulemaking would permit dedicated short-range communications highway safety systems to share the band as co-primary users. The notice also seeks comments on the need for nationwide operational standards and channelization, and on the potential for sharing with other services.

The notice is in response to a petition from the Intelligent Transportation Society of America (ITS America), a consortium of nearly 700 international, federal and state transportation and public safety departments, state and city governments, automobile manufacturers, insurance companies, public safety organizations, universities, research facilities and technology manufacturers. Commercial interest in so-called intelligent transportation systems has been growing since the passage of the Intermodal Surface Transportation Efficiency Act of 1991, or "ISTEA," which sets federal goals for using technology to develop safer, more efficient highways.

Proponents say the band is optimal for the new use on the basis of propagation, consistency with international allocations, and compatibility with existing users. However, in its comments filed in response to the original ITS America Petition for Rulemaking, the ARRL questioned whether the band is appropriate and urged the FCC to look into frequencies above 40 GHz, where such systems could avoid interference from other users. The League said the ITS proposal along with the FCC decision in January of 1997 to deploy unlicensed National Information Infrastructure (U-NII) devices to operate at 5.725 to 5.825 GHz could render 175 MHz of spectrum in the 5.8 GHz range significantly less useful to amateurs.

3M, a proponent of the proposal, has argued that hams should be displaced from the band because they already have plenty of spectrum between 50 MHz and 50 GHz and make only light use of 5.9 GHz. 3M suggested that a powerful amateur station could "swamp out" intelligent highway services. The FCC said interference problems that might crop up could be resolved by changing the frequency of the amateur operation, by power reduction, or by using directional antennas.

Possible ITS applications include so-called "automated roadside safety inspection," which permits transmission of vehicle safety and other data between roadside inspection stations and commercial trucks moving at highway speeds. Another potential application, "incident management operations," would use roadway sensors and specially-equipped vehicles to detect more quickly traffic congestion and dispatch emergency personnel or take other action. Other emerging applications include traffic control and en-route driver information systems.

Comments on ET Docket 98-95 are due 75 days after publication in the Federal Register. The complete NPRM is available on the FCC Web site at **http://www.fcc.gov**.

Media Hits

- A recent story in the *Roanoke* (Virginia) *Times,* "Law Signals Positive Change for Hams" took the high road in reporting about a bill just signed by the governor that limits local control over Amateur Radio Antennas. One of the bill's chief proponents, Bob Ham, KK4IY, of Vinton, Virginia, was featured prominently.
- Andrew Funk, KB7UV, reports that WAGA-TV (Fox-5) in Atlanta, Georgia covered the ARRL SE Regional Public Service Meeting at the Georgia State Convention. It was the third news segment on the 10 PM news. Funk is Assistant News Operations Manager at the station.
- A recent story in the *North Hills News Record* (Warrendale, Pennsylvania) highlighted Bob Ferry, Jr, N3DOK of Pittsburgh. The piece featured Ferry's work with SKYWARN and how he became involved in Amateur Radio. A sidebar article told readers how they could become volunteer storm spotters. Incidentally, Ferry is also an ARRL PIO who is active on the League's new Public Relations reflector. The reflector was created as a forum for those who are interested in promoting Amateur Radio to the news media. If you want to get involved, send your full name, call sign, and e-mail address to Jennifer Gagne, N1TDY, at **jgagne@arrl.org**.

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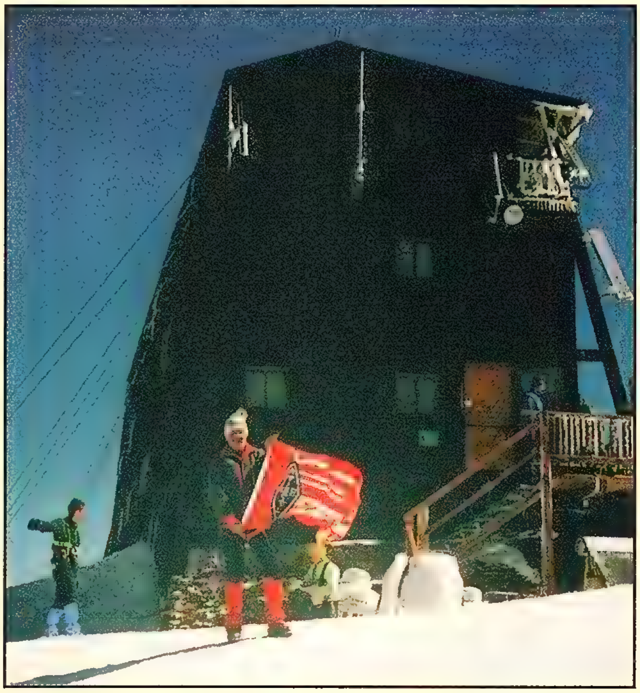
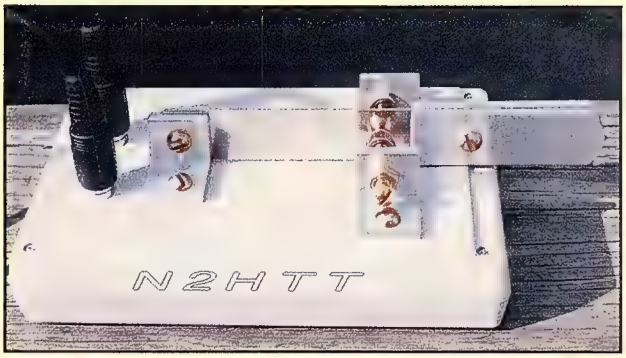
"I claim this mountain in the name of microwave!" Don, WB1FKF, brought his 10-GHz gear to the top of Mt Wachusett (Massachusetts) for last year's ARRL 10-GHz Cumulative Contest. He finished fourth in the 1st call area and 9th overall. August is the month to take a 10-GHz rig and head for the high ground for the 1998 competition! See the rules on page 87 of your June *QST*.



"And I claim this mountain in the name of the ARRL!" Mario Olmo, I1OLM, enjoys visiting snow-encrusted European mountaintops. When he trekked to this refuge near the 14,000-foot summit of Monte Rosa in Italy, Mario brought along his 2-meter H-T and an ARRL flag.

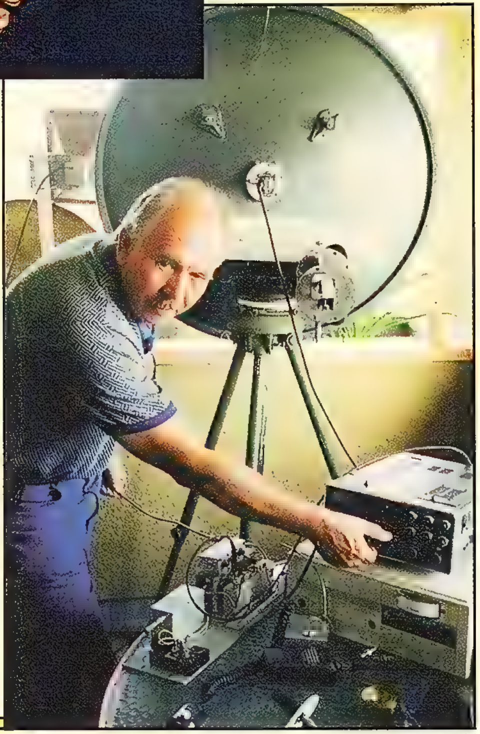
Meet the new member of the club. The Amateur Radio Club of Augusta, Georgia welcomed a new member the other day—congressional representative Charles Norwood. They also presented the congressman with a plaque and certificate in recognition of his support of Amateur Radio. Witnessing the presentation were (back row, left to right) Charles Finer, KF6XX; Henry Arostegui, KN4AV; Frank Scoggins, KS4OC; Joe Semer, KD4WYP and Richard Bradley, KE4HZM. In the front row (left to right) are Bob Johnsen, KD4LSB; Terry Brown, KE4MHN; Representative Norwood; David Phillips, KU4HX and James Tarpley, KN4UE.



Inspired craftsmanship. Mike Aiello, N2HTT, was inspired to make this set of paddles after he read "Make Your Own Code Keys" by Jeff Gold, AC4HF, in the February 1998 *QST*. The arm of Mike's key is a discarded slot cover from a PC. The support hardware and finger pieces were cut from inexpensive extruded aluminum stock. The base is a Radio Shack project box filled with lead fishing weights. Mike says it works great and stays put!

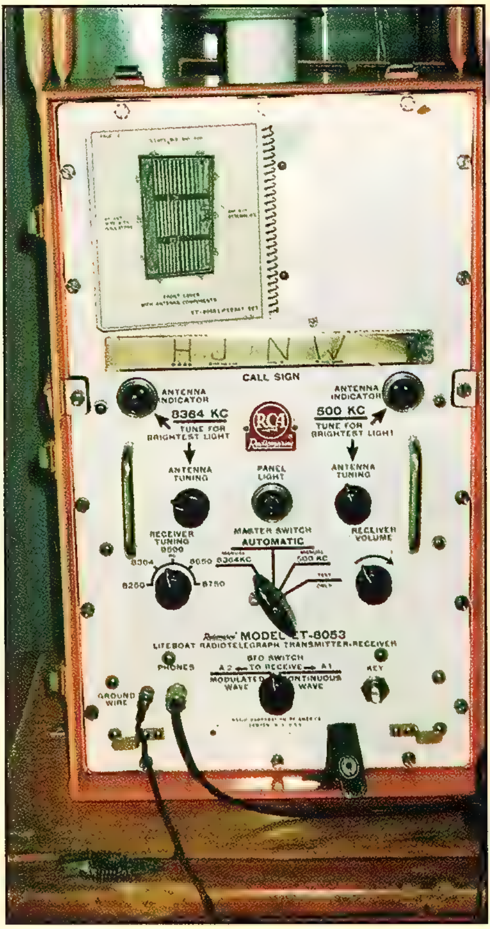
LARRY VAUGHN, KD6NZW

The Southwestern Division convention is an excellent way to wrap up the summer. At last year's convention in Riverside, California shuttle astronaut Ron Sega, KC5ETH, presented two shuttle patches to Laura Oestman, KF6NJW, for being the youngest (and most recently licensed) ham at the event. In the background is Joel Harrison, W5ZN, ARRL Vice President.



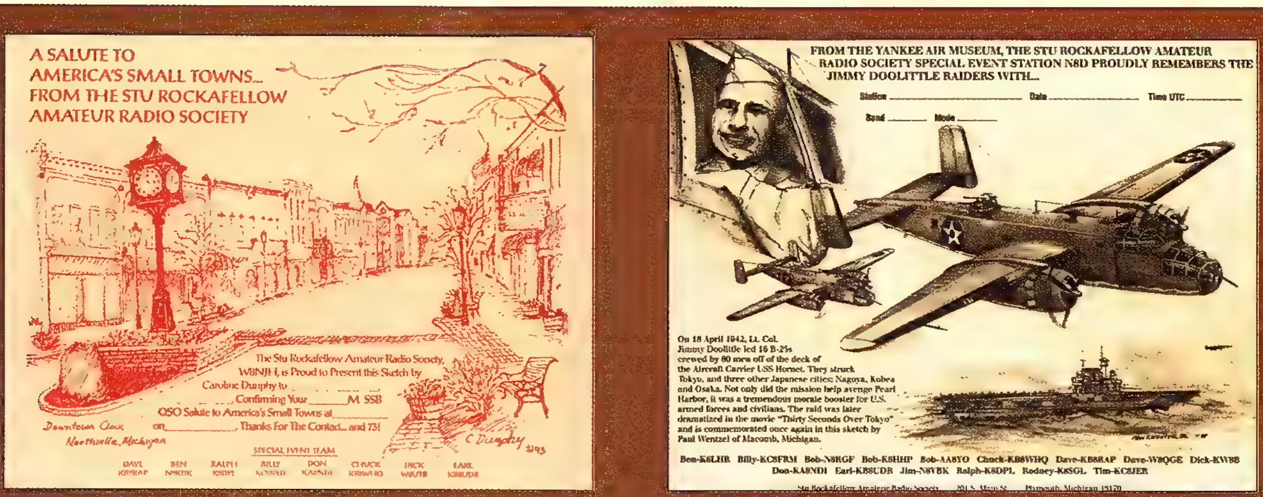
LARRY VAUGHN, KD6NZW

Across the street Dick Bremer, WB6DNX, was demonstrating 2304-MHz gear at a hospitality suite sponsored by the San Bernardino Microwave Society. The 1998 Southwestern Division convention takes place August 14-16 in San Diego. See "Coming Conventions" in this issue.



Calling all lifeboats! When Lanny Marcus, W5MDT/HK5, was vacationing in the Parque Nacional del Café (National Park of Coffee) in Montenegro, Quindio, Columbia, he snapped this photo of an unusual piece of gear resting inside a shipping container. The RCA "Lifeboat Radiotelegraph Transmitter-Receiver" (model ET-8053) featured a built-in hand-cranked generator. Lanny guesses that this is a fairly old unit, although it was in pristine condition. If you know anything about this radio—especially the year it may have been manufactured—you can e-mail Lanny at **lannym@cali.cetcol.net.co**.

Diebold ARC members make a fashion statement. Teal polo shirts are definitely *in* this year. The club recently took part in an annual company wide "quality fair" by introducing their fellow Diebold workers and families to Amateur Radio. Standing from left to right are: Robert Bowser, KB8ZXA; Al Day, K8AL and Craig Hockman, N8OH. Seated from left to right are Paul Bruski, KF2AA; Roger Gray, W8VE and Ken Kontor, W8KEN. More than 1600 people visited 40 exhibits showcasing associate teams from across the country. The W8ATM on-site station offered continuous demonstrations of various modes from HF phone and CW to transmitter hunting. Founded in 1859, Diebold develops, manufactures, sells and services ATMs, smart card systems, automated medication dispensers and more.



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QSO Salute to America's Small Towns at____________
on____________. Thanks For The Contact... and 73!

Downtown Clock
Northville, Michigan

C Dunphy 2/93

SPECIAL EVENT TEAM

DAVE BEN RALPH BILLY DON CHUCK DICK EARL

FROM THE YANKEE AIR MUSEUM, THE STU ROCKAFELLOW AMATEUR RADIO SOCIETY SPECIAL EVENT STATION N8D PROUDLY REMEMBERS THE JIMMY DOOLITTLE RAIDERS WITH...

Station ____________ Date ____________ Time UTC ____________

Band ______ Mode ______

On 18 April 1942, Lt. Col. Jimmy Doolittle led 16 B-25s crewed by 80 men off of the deck of the Aircraft Carrier USS Hornet. They struck Tokyo, and three other Japanese cities: Nagoya, Kobea and Osaka. Not only did the mission help avenge Pearl Harbor, it was a tremendous morale booster for U.S. armed forces and civilians. The raid was later dramatized in the movie "Thirty Seconds Over Tokyo" and is commemorated once again in this sketch by Paul Wentzel of Macomb, Michigan.

Ben-K8LHR Billy-KC8FRM Bob-N8RGF Bob-K8HHP Bob-AA8YO Chuck-KB8WHQ Dave-KB8RAP Dave-W8QGE Dick-KW8B
Don-KA8NDI Earl-KB8UDR Jim-N8VBK Ralph-K8DPL Rodney-K8SGL Tim-KC8JER

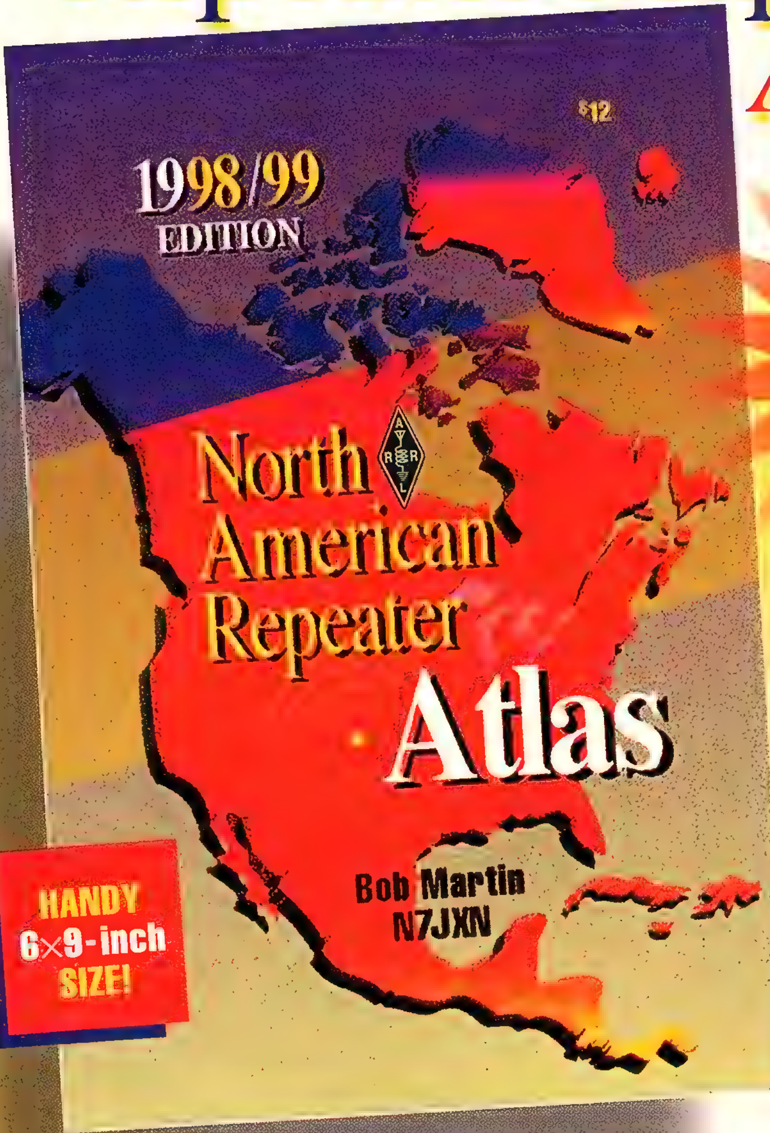
Stu Rockafellow Amateur Radio Society 201 S. Main St. Plymouth, Michigan 48170

Ars gratia artis. When the Stu Rockafellow Amateur Radio Society in Plymouth, Michigan sets up special-event stations, they turn to local artists to design their certificates. They approach the artists with design ideas, or simply use drawings the artists have already created. The relationship benefits the hams and the artists. (Who wouldn't want their artistic talents on the walls of hundreds of ham shacks throughout the country?)

Ray Rising, K4LWJ/HK3BBR, is glad to be home and enjoying freedom and Amateur Radio. He was taken captive by Colombian guerrillas on March 31, 1994 and held for 810 days. Ray is shown here with one of the few personal items his captors allowed him to keep: his SWL radio and an antenna made from a scouring pad. He says, "Did you know there is about 80 feet of wire in a scouring pad?" On Christmas Eve 1994 he used the radio to listen to a message from his wife (in English) broadcast by a Colombian shortwave station. Ray is a missionary with JAARS (Jungle Aviation And Radio Service), which is a support arm of the Summer Institute of Linguistics, better known as the Wycliffe Bible Translators.

G'day from Down Under. When American amateurs are locked in winter's icy clutches, it is summer hamfest time in VK land. The Wyong convention takes place each February at a location north of Sydney, Australia. The gathering is hosted by the Gosford Amateur Radio Club and always draws a crowd. Their sun-splashed flea market (above) is the main attraction. The VK2 QSL bureau (right) seeks a shadier spot to receive and distribute cards. *Our thanks to Mark Wylie, VK2HMW, for providing these photographs.*

Repeater Maps—*And More!*



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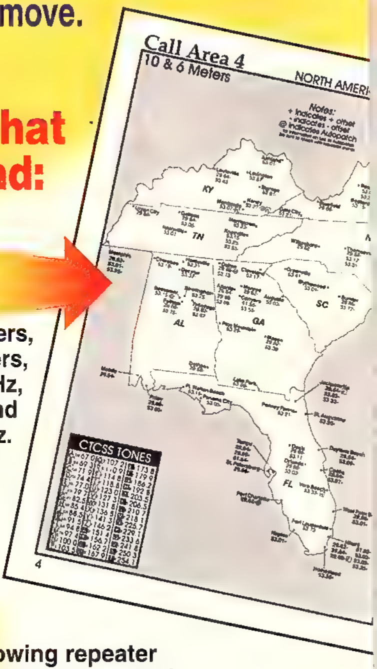
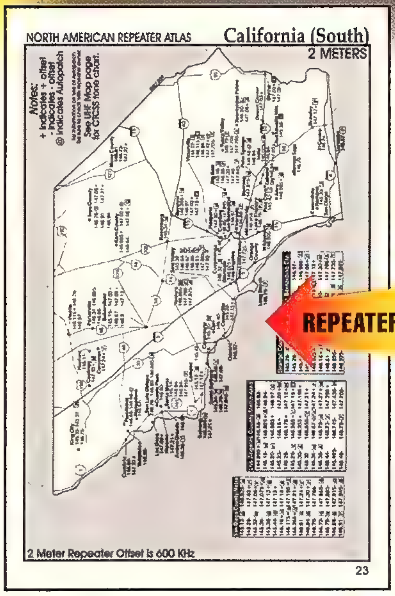


STREET MAPS showing repeater frequencies for most US metropolitan areas.


NORTH AMERICAN REPEATER ATLAS
California (South)
2 METERS
2 Meter Repeater Offset is 600 KHz
23

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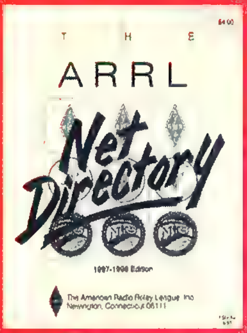
THE ARRL Net Directory
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The American Radio Relay League, Inc
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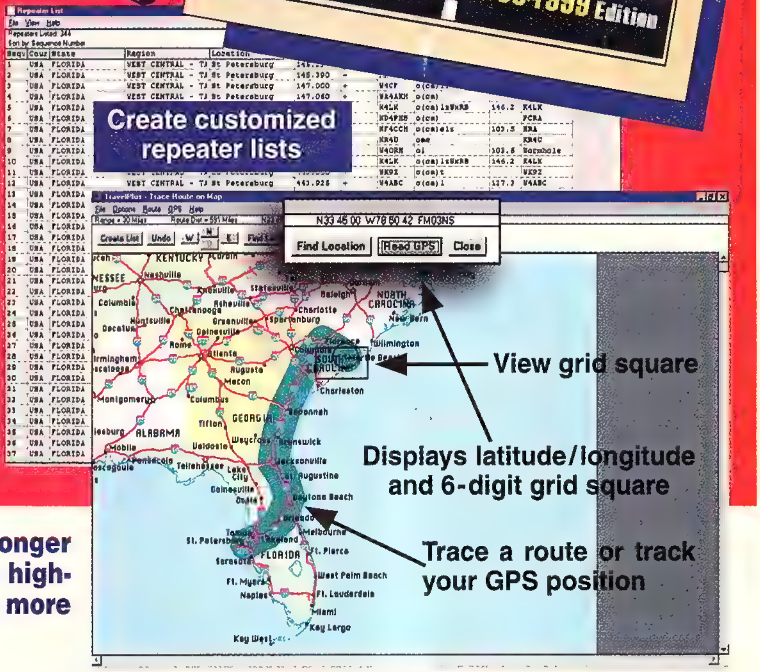
ARRL Net Directory included on CD-ROM!



N33 45 00 W78 50 42 FM03NS

Create customized repeater lists

View grid square

Displays latitude/longitude and 6-digit grid square

Trace a route or track your GPS position

TravelPlus has two sets of maps. For planning longer trips, you can choose maps that display major highways and cities in the US or Canada—or choose more detailed maps that add US state highways.

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THE INTERNET IS NOT THE ENEMY

♦ Internet access is finally becoming practical and affordable for amateurs here in Yugoslavia. A few weeks ago I posted a letter to a ham newsgroup on the Internet, asking for help to link two PCs. One is functioning as a packet radio BBS while the other serves as my window to the Internet. By connecting the two systems, I hoped to set up a gateway to pass messages from the Internet to our ham packet network, and vice versa.

Although I did receive some helpful advice, I was bombarded with hateful messages from hams who were outraged by what I was about to do. The insult-laced messages stated that ham communication must be kept "pure"—free of so-called "land line LIDs" such as my compatriots and myself. Needless to say, I was shocked and dismayed at this response.

Here in YU land, we have many engineers, teachers and students who might be attracted to Amateur Radio, but they are not willing to join a hobby that merely worships the past rather than exploring new technology. The Internet is the future. It is not going away. The explosion of new telecom options, computer networks and other high-speed commercial links are not threats to ham radio. On the contrary, we can use them as tools to enhance our hobby. The true enemies of Amateur Radio can be found among those who refuse to accept change and desire to keep us mired in the past.—*Miroslav Skoric, YT7MPB, Novi Sad, Yugoslavia*

HAM RADIO ON THE HIGH IRON

♦ Have you ever sat down with your *QST* and thought to yourself, "Boy, I could write an article about (fill in the blank) and send it in."? Well, I thought about it, but Steve Ford, WB8IMY, beat me to the punch with "Ham Radio on the High Iron" in the May issue!

Last September, my wife and I journeyed from Cleveland to New York on Amtrak. Not having portable packet capability, I simply took an H-T and a roll-up J-pole antenna. Identifying myself as "Amtrak portable" brought a lot of attention! I always wanted to do this because 12 years ago, while in the Army, I saw a ham doing the very same thing!

If you plan to travel by rail this summer, I highly recommend high-iron hamming. If you're in a sleeper car, you'll have 120-V ac available, which is handy for powering your gear. If you're riding coach your power options are more limited, although some cars have ac outlets. The Amtrak crews are very accommodating, but return the courtesy by letting them know your intentions. I've never been denied operating while rolling along, but you never know till you ask. Give "rail mobile" a shot. It is a lot of fun!—*Pete Greene, N8WGE, Eastlake, Ohio*

♦ I would like to commend Steve Ford, WB8IMY, on his article "Ham Radio on the High Iron." I'm also a train fanatic. Each year I take a different train to see parts of the country that I've never seen before. There are dozens of different Amtrak trains to choose from, with trips lasting from 2½ hours to 3 days.

Imagine having your H-T on a long-haul train during a VHF contest! You could be a "railroad rover," working from an astonishing number of grids during your trip. You could easily rank among the high scorers, even if you only make a few dozen contacts!—*Ken March, KF6AGM, Fremont, California*

WA1AW

♦ Having applied for and received the call WA1AW in late 1997, I realized that with such a call—one that could be confused with the prestigious W1AW!—I should also upgrade from Advanced to Amateur Extra.

I then purchased a copy of the ARRL's Extra Class study guide and began to dig into all 400 questions in the pool. I'm happy to report that I easily passed the Amateur Extra exam, which was administered by ARRL VEs through the Braintree (Massachusetts) Civil Defense. I aced the code test, also thanks to an ARRL publication, albeit an old one! It was *Learning the Radiotelegraph Code*, the book that put me on the road to becoming a 35-WPM CW operator in the late '60s.

I'm grateful to the VEs and the ARRL VEC for providing opportunities for persons like myself to upgrade or receive their first licenses. I also thank the ARRL for being involved with the creation of the Incentive Licensing Program. Yes, I know the controversial history. While recently reading "Correspondence" in the December 1967 *QST*, I realized that in those days many people thought Incentive Licensing would kill Amateur Radio. Thirty years later, the hobby is still here, and as much fun as always!—*Michael Edward Amaral, WA1AW, Norwood, Massachusetts*

DIGITAL VOICE ASAP

♦ Amateur Radio should move toward digital audio transmission as soon as possible.

SSB was developed in 1955. Rip Van Winkle could wake up from a 40-year nap, fire up his ancient Hallicrafters transmitter and receiver, and get into a QSO with a ham using a transceiver that claims the latest DSP technology but still transmits and receives hoary old analog carrier-suppressed single-sideband signals. FM was developed in 1940. CW harks back to Hiram Percy Maxim and the Wouff Hong.

Our competition is the Internet and cellular phones. It has been growing by leaps and bounds, while the number of new Amateur Radio licenses has been plummeting. There are about 100 Internet users for every ham. The Internet is all digital, and transmits audio, video, images, animations, and programming instructions. Every few months something new comes on the scene.

Cellular phones are now as small and convenient as the smallest hand-held amateur transceivers. Moreover, cellular repeaters have far better coverage than amateur repeaters nearly everywhere in the United States and in the world. Far more people own cellular portable phones than own amateur hand-held radios.

Ham radio's main advantage continues to be the ability to communicate where there is no infrastructure. Even so, we need to update our capabilities before communications professionals write off ham radio as a dinosaur.

With modern digital compression it should be possible to put very clean audio and some additional subchannels on a narrow bandwidth. The audio signal would normally be transmitted clear, but there would be an option for public key and private key encryption. There would be a provision for continuous automatic call sign transmission, together with the person's name and address. There would also be a provision for continuous transmission of the person's exact location, obtained from the Global Positioning System (GPS) satellite network. A call for help could be relayed directly to search and rescue authorities with an exact location. On frequencies where greater bandwidth is feasible, the standard could include provision for video signals. Surely others can think of additional provisions to be incorporated into a digital Amateur Radio standard.

If Amateur Radio is to survive in the 21st century, it had better become a 21st century communications service.—*Martin K. Barrack, KK5XW, Hardy, Arkansas*

TEN-METER INTERFERENCE

♦ I was thrilled to read in the June issue of *QST* about the efforts made in New York City to stop the illegal use of my favorite band—10 meters. Congratulations to everyone involved! Unfortunately, we have more work ahead.

When I first got my Technician Plus ticket in 1994, my family gave me a 10-meter monoband rig called the Emperor. It was similar to a Uniden HR-2510 transceiver and it was a good starter rig, although I often wondered why I didn't see it advertised in ham magazines.

Soon thereafter I started to receive mailings from the company that sold the Emperor. The catalogs were clearly targeting the CB community. At first glance the transceivers even looked like CB rigs, right down to the channel indicators with the LED displays set to "40." But when I read the text I discovered that these were all-mode radios, including FM. Worst of all, their frequency ranges usually included the first 500 kHz of the amateur 10-meter band!

Here in central New Jersey, we are seeing increased interference problems from people who are using transceivers like these (and illegally modified CB radios) to invade 10 meters. Incredibly, some of the perpetrators are local dump truck operators!

These incursions are more than petty annoyances. I lost a QSO with an EA8 station on CW when one of these guys came on and (using AM) told me I was "jamming him and his buddy!" During phone a contact with a ham in Florida, someone interrupted and demanded our "unit number." When we attempted to change frequency this guy followed us and played music for the next 10 minutes.

I urge my fellow hams to educate the public, CBers included, about these out-of-band transceivers. Tell them the radios these companies are selling are nothing but trouble. Tell them how these rigs are used illegally to harm law-abiding Amateur Radio operators. I hope the FCC, and our ARRL members, can get together to put a stop to this activity and regulate what can be sold under the guise of "ham radio equipment."—*Drew R. McCarsky, KB2SEO, Point Pleasant, New Jersey*

OOPS! WRONG FIELD DAY

◆ I wear my call sign hat (with N3HLM embroidered on it) to a lot of places. While at the Colonial Highland Gathering (a Scottish event) in Fairhill, Maryland, this past May, just before Field Day, I saw a man with a hat that read "BSRC Field Day." I thought, How cool! A fellow ham with a Field Day hat!

I caught up with him and introduced myself. It didn't take long to discover that he knew very little about Amateur Radio. BSRC means: Bio-Sciences Research Center. I guess at their Field Day event they have to use alternative energy to run their microscopes. I felt a bit embarrassed, but it was worth a try.—*Michael C. Migliaccio, N3HLM, Philadelphia, Pennsylvania*

75 METERS—PRO AND CON

◆ I agree with David H. Jenkins, KB8SUA, about the cesspool on 75 meters ("Correspondence," June 1998 *QST*). When I started studying to get my ticket back in 1996 I was very excited to become an Amateur Radio operator. I had no idea that the kind of language that I was trying to get away from on 11 meters (CB) was on the ham bands.

I told my wife that ham radio was better than CB. I told her that the people were nicer and had respect for one another. When I upgraded to Technician Plus in 1997 and got my first HF rig, I tuned to 75 meters and was astonished at the filth that I heard there. (Even though I cannot use that portion of the band, I like to listen to our West Virginia Phone Net.)

I know the Official Observers have tried to curb the insanity, but it seems to be getting worse. Will the FCC eventually step in? They've haven't so far, but if we began showering them with mail *demanding* action, they might finally do something.—*Juddie D. Burgess, KC8CON, Fayetteville, West Virginia*

◆ I was somewhat troubled by the letter written by Dave Jenkins, KB8SUA, where he laments about what he perceives as the "75-meter Cesspool." I found his inference that all hams should conduct themselves as "ladies and gentlemen" particularly disturbing.

Seventy-five meters has always been different from the other ham bands by the fact that it supports primarily regional nighttime communication. It is a gathering place not unlike an Internet chat room. As a result, attracts its share of eccentrics and oddballs. I, as well as thousands of other hams, find this quality refreshing given the rather boring mentality that sometimes plagues the other bands. Just how many times can you endure QSOs that consist of mind-numbing exchanges of name, city, signal report and "73" before becoming totally turned off by Amateur Radio? In a real sense, 75 meters is the most "human" of all of our bands. You won't encounter too many boring conversations there!

There is a dangerous mindset that is descending upon the ham community. It's the movement to silence other hams who say things that some of us may not agree with. Believe me, the best thing you can do for Amateur Radio is to get on the airwaves. We need more activity, not less. It's time for the radio police to realize that their efforts to censor their fellow amateurs is counter to the preservation of this great hobby. We should be *promoting* free speech on our bands! The day the self-righteous censors are victorious is the day we lose our bands forever.—*Frank Czaja, W9XZ, Greenfield, Wisconsin*

CREDIT WHERE CREDIT IS DUE

◆ In the "Up Front" section of the April *QST*, the caption under the photograph of my "Cootie" key identified me as the builder. Actually, this marvelous key was crafted by John Myers, W9OK. John took an old design and made many refinements, including a specially engineered armature for the key. When he had one down to perfection, he made a duplicate for me. We should give credit where credit is due.—*Mike Hyder, N4NT, Johnson City, Tennessee.*

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By WA5QHV.

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If you're traveling with UHF gear, don't forget the **ARRL UHF Contest**, August 1-2. Even if all you have is a 440 FM rig in the car, park it on 446 MHz simplex and make some contacts. While you're lounging at your vacation destination, take a little time to enjoy the CW portion of the **North American QSO Party** on the same weekend (the phone competition is August 15-16) and the **10-10 International Summer Phone Contest**. If you find yourself at a mountaintop retreat, take along some gear for the ARRL **10 GHz and up Cumulative Contest**, August 15 and 16.

Arlene Schwartz, KE6GFI, takes a relaxed approach to the ARRL UHF Contest from the sands of Laguna Beach, California.

Before you finalize your travel itinerary, make sure you leave plenty of free time on the weekend of August 15 and 16. No less than *four* conventions are scheduled: the **Alabama Section Convention** in Huntsville, the **Colorado State Convention** in Golden, the **New Orleans International DX Convention** and the **Southwestern Division Convention** in San Diego.

More conventions will be taking place in the East at the end of the month. The **New England Division Convention** (known to the natives as simply "Boxboro") will be held August 29 and 30 in ... Boxboro, Massachusetts. Visit Weston, West Virginia, on the same weekend for the **West Virginia State Convention**.

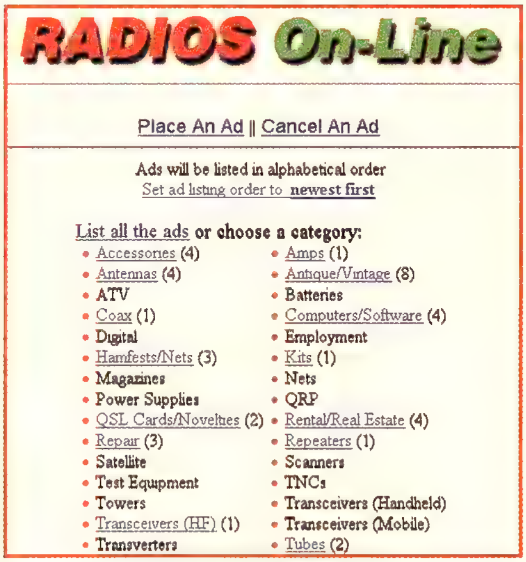
If you plan to attend the Southwestern Division Convention in San Diego, think about fitting in these two ARRL-sponsored continuing-education workshops:

***ARRL Technical Workshop: RF Safety—The FCC RF Exposure Regulations** by ARRL Lab Supervisor Ed Hare, W1RFI.

***AMSAT/ARRL Workshop: Amateur Satellites—Today and Into the Future** by Keith Baker, KB1SF, and other AMSAT experts.

These fast-moving five-hour presentations take place on Friday afternoon, August 14. The registration is $20 for ARRL members ($25 for nonmembers). Space is limited! To preregister contact Dan Miller, K3UFG, at 860-594-0340, or via e-mail at **dmiller@arrl.org** before August 4.

This month we're proud to announce the debut of a new ARRL Internet service—**RADIOS On-Line.** Just go to **http://www.arrl.org/ads/RadiosOnline/** to buy and sell used gear to your heart's content!



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By Dennis Motschenbacher, K7BV

High Adventure on St. Paul's Island

The CY9AA DXpedition

High winds. Driving rain. Toweing seas. Intrepid adventurers stoically pushing their imperiled boat toward a landing on a rocky beach... A classic movie? The stuff of legends? A DXpedition? If CY9AA is in your logbook, the story behind the contact will give you a new appreciation of what it can take to make it happen.

The motives that drive Amateur Radio operators to undertake DXpeditions are as diverse as the personalities of the operators themselves. Some are perfectly happy achieving their operating goals by traveling to a "rare" country with a small number of licensed hams. More often than not, these ops have a solid roof over their heads, and meals and drink are readily available. The biggest danger is a customs official with a bad attitude.

As the saying goes, "different strokes for different folks...."

As a member of the three-man CY9AA DXpedition, I can tell you that we prefer to push the envelope in the pursuit of challenges that bring a higher degree of personal satisfaction. We are part of a relatively small group of men—and women—who seek out uninhabited islands, sandbars and rock piles that are surrounded by the world's untamed oceans.

Despite modern transportation systems and the creep of civilization, DXpedition destinations throughout the world continue to beckon strong-willed operators. The dangers and logistic challenges associated with operating from these DXCC "countries" vary greatly. Time and money are two factors that often limit available choices, as many of these locales are difficult to reach by conventional means (commercial airlines, scheduled ship movements, etc).

St. Paul's Island (CY9) is one of the ex-

Mike, VE9AA, inspects the car and truck carrying the 1.5 tons of gear and supplies.

ceptions. At first glance it appears to be an easy DXpedition destination because it's situated only 15 miles off the coast of a populated land mass, the Highlands of Cape Breton Island, Nova Scotia, Canada. Under ideal conditions, the island can be easily approached by boat or helicopter. The weather can be pleasant and warm in the summer months. Or things can be totally different, as we discovered, and the island can be one of the most dangerous in the North Atlantic.

The Island

St. Paul's Island probably made its first appearance on a map around the year 1600. It lies in the heavily traveled Cabot Straits that lead into the Gulf of St. Lawrence. The storms in this part of the North Atlantic are legendary. Winter squalls can drive massive waves up and over the 30-meter island cliffs. A lighthouse keeper from the past told of one particularly huge North Atlantic wave that swept over the cliffs, catching him outside and in the open. Before the water receded it had slammed him under his doorsteps and knocked out every basement window.

Ice floes completely cut off sea access to the island for three months each winter. Frozen storm-driven spray from the angry seas can accumulate to a thickness of *six feet* on the exterior walls of the lighthouse keeper's North Island house. The lighthouse keeper and his family often had to use a chisel to chop their way out of the house after one of these winter storms.

There have been at least 93 recorded shipwrecks on St. Paul's Island—and it's anyone's guess as to how many never made it into the record books. More than 1000 people have lost their lives in the squalls, hurricanes, ice, fog and wild currents associated with the island. This DXCC country is frequently referred to as the "Graveyard of the Gulf."

On Cape Breton, ghost stories abound. Many visitors to St. Paul's Island claim to having seen or heard the ghosts of the souls lost in the shipwrecks. One story tells of a four-year-old crying girl being discovered among the rocks by some fishermen from Bedford. No evidence of a shipwreck could be located, and how she got there is a complete mystery. The child was rescued and eventually taken to Massachusetts, where her descendants still reside.

Only a week before we (the CY9AA gang) showed up to board our chartered transport vessel, the *Heidi M*, Captain Robert Courtney had to hastily recover another island explorer—after only one night's stay! The gentleman, who had previously made arrangements to stay on the North Island for a full week, claimed "the ghosts had terrified him all through the night." He frantically called on his marine radio, begging for immediate evacuation.

To add to the mystery, the island's small lakes contain no fish. There have been many failed efforts to bring deer and rabbits to the island to provide food for shipwreck survivors. One belief is that the island is "dead" and refuses to support life of any kind other than the tangled scrub growth present on the South Island.

St. Paul's Island consists of one large island (generally referred to as the South Island) about three miles long with a maximum width of about one mile, and a small islet (the North Island) that is about three acres in size. The CY9AA operation took place from the North Island because it offered a clear view of all compass directions.

A narrow 25-meter strait called "The Tickle" separates the North Island from the much larger South Island. As you'll see later, we had to land our equipment and supplies by row boat in this Tickle because it offered the only shelter from a severe storm that came up during the passage to St. Paul's Island. The Tickle is actually the only place a rowboat can off-load equipment onto the rocks. The waves are much calmer in this area.

Today, both islands are uninhabited. The South Island had a small population for almost 150 years, reaching back to the early 1800s. Thirty-meter lighthouses were erected on both islands at that time to alert passing ships of the danger. At one time, St. Paul's Island actually had a Governor, a telegraph office and a productive cannery with a permanent workforce. The lighthouses were eventually automated and the last resident (living on the North Island) was relocated in 1992. The lighthouse keeper's house on the North island was the only structure capable of sheltering the CY9AA operation from the howling winds and rain that welcomed us during our June 27, 1997, landing.

A Call to Adventure

The CY9AA radio quest began in July of 1996 on a chartered airplane flight from Sable Island (CY0) to the Canada mainland. Aboard was Mike Smith, VE9AA, from New Brunswick, who was returning from the CY0AA DXpedition he had worked with two American hams. Mike was flush with the feeling of satisfaction that permeates the soul of every successful DXpedition operator after the radios are finally silenced. At that very moment he committed himself to go someplace else as soon as possible to once again feel the "rush" of working the endless pileups.

Before he landed he decided that St. Paul's Island—CY9—would be his next operation, and that 160 meters, 6 meters and the WARC

The abandoned lightkeeper's house became CY9AA headquarters.

This is the forbidding face of North Island. Winter storms can send waves crashing over the *tops* of these 30-meter cliffs. The landing site is visble at the far left.

The CY9AA team prepares to depart. From left to right: Mike, VE9AA; Dennis, K7BV; Doug, VE1PZ.

Mike, VE9AA, bangs out the contacts!

bands would be its primary focus. A few months later, Mike asked his friend Doug Shepard, VE1PZ, from Pictou, Nova Scotia, to join the team. Doug is an avid 160 and 6-meter DX fanatic and a "mountain" of a man whose strength and will power would be indispensable during the island ordeal.

The two eventually decided they needed a third operator to share in the back-breaking effort of moving supplies and erecting antennas. In his search for the third operator, Mike posted an "Operator Wanted for CY9" message on the VE7TCP DX Reflector. Says Mike, "I wondered if anyone would take me seriously—and I was pleased when I got nearly 50 responses." Some were "tire-kickers," but most were from responsible, experienced operators sincerely interested in going. In the end, they chose yours truly to serve as their "rate man" on CW!

Our team would require a great deal of support to ensure success, and assistance came from many well-known sources. Cushcraft provided a complete arsenal of HF and VHF antennas that performed beautifully. An R-7000 vertical at cliff's edge, 30 meters above the ocean, provided more than half of our contacts. The Radio Works donated a Carolina Windom antenna and thousands of feet of support rope and coax. N7EN loaned the group a complete set of Dunestar band-pass filters (which turned out to be a real blessing). Heil Sound was kind enough to ship headsets for each operator. And WJ2O stepped forward and volunteered to print 10,000 QSLs for CY9AA.

The UKSMG provided a Web site and Chris, G3WOS, kept it current as the plans for the DXpedition progressed. Generous cash donations were received from the NCDXF, UKSMG, SMIRK, RSGB/Chiltern, FDXG, and GJ4ICD (CDs). Many European and US VHF operators made individual donations acknowledging Mike's commitment to make CY9 available on 6 meters. According to Mike, the trip would have been impossible without funding from the VHF supporters.

For the next few months, hundreds of e-mail messages were exchanged between Mike, Dennis and me, as we worked feverishly to finalize the details of the DXpedition. On June 22, the three of us met in person *for the first time.*

Three Honda generators had to be rented, and gas and water cans had to be picked up. To ensure a functioning balloon-lofted 160-meter wire vertical, a bottle of helium was needed. We had fun picking up a "life sustaining" supply of hot dogs, canned beans and soft drinks. We would later be happy to discover that someone had procured a large bottle of aspirin to soothe aching muscles.

The early hours of June 25 were devoted to packing two cars and one truck with DXpedition gear. A little after 4 PM, we—the three CY9AA operators—climbed into our vehicles. Already excited, we headed for Bay St. Lawrence, four hours away at the northeast tip of Cape Breton Island, Nova Scotia.

There we checked into a motel managed by a man who had lived on St. Paul's Island as a child with his lighthouse keeper father and family. Sleep came in the form of restless short naps as we began to imagine the pileups that awaited us sometime after sunrise.

Up early, everyone was soon down at the docks looking for Captain Courtney and the *Heidi M.* The Captain had bad news. High winds were expected to pick up about midday, which would make a safe landing impossible. A few hours later, the winds did indeed climb and the departure was officially called off.

Disappointed, but not willing to give up, we again met with the Captain to see if he was willing to try a night landing if conditions improved. The Captain looked at us as though he thought we might be a little crazy, but he said he would give it a try if we so desired.

(After the DXpedition was over and we had returned to Bay St. Lawrence, we discovered that the *Heidi M* was actually the *Heidi M II.* The Captain had to abandon the original *Heidi M* and spend the night in a rubber raft in a nasty storm near St. Paul's Island one year earlier. The Captain certainly wasn't a coward. He would further prove that during the passage to the island and the subsequent landing.)

We started loading the equipment below decks. Everything that wasn't stored below had to be firmly secured to the boat in anticipation of rough seas. Half a ton of gas and of water were also transferred aboard. The hours passed and the winds kept climbing.

Darkness fell and we finally had to admit that a night landing seemed to be out of the question. The winds were expected to diminish by morning, so we decided to sleep in our cars, which were parked alongside the *Heidi M,* so we could depart on a moment's notice. Sleep, for the second night in a row, was a struggle.

Our sleep was further complicated with middle-of-the-night visits by drunken crewmen returning from a nearby pub. They were particularly interested in the unfamiliar outline of the assembled R-7000 antenna and tower sections strapped to the top of the *Heidi M*'s cabin. One unsteady sailor nearly stumbled into the bay while pondering the antenna's value. Listening to this ruckus provided us with a moment of comic relief.

Morning's first light found the Captain waking us to announce that he was ready to make a run for the island. A storm was moving into the area soon and it was now or never—at least for another day! We climbed aboard immediately.

As the *Heidi M*'s diesel engine warmed up, the Captain brought around the rowboat we would use as a landing craft and secured it to the stern. The other crewmen refused to make the passage, so we departed without them, muttering less-than-complimentary comments under our breath.

We left port on the morning of June 27, knowing that we were going to squeeze in between storms. We weren't even half way to St. Paul's before Mother Nature's angry skies swept in on us earlier than anticipated. Twice during the passage, the Captain had to bring the *Heidi M* dead in the water so he could go over the stern in pounding seas to deal with the swamped and uncooperative landing boat we towed behind.

Captain Robert Courtney prepares to take Doug, VE1PZ, and a load of equipment ashore.

The pitching of the boat had everyone concerned about the possibility of swamping. I was unhappy with the amount of water we were taking over the sides. The *Heidi M*'s gunwales disappeared into the wave walls for uncomfortably long periods of time while the Captain was aboard the row boat bailing out bucket after bucket of seawater. Soon the rain came and we all knew that a landing might not be possible. Few words were spoken as the Captain remounted his chair and began navigating his 34-foot cod boat as best he could into the mounting seas. Never once did he suggest that we turn back.

We finally spotted the southern island on radar. Another hour and we had her in sight. As we made passage down the leeward side of the South Island, the winds went up another notch and turned toward an unfavorable direction. The Captain pressed onward. The three of us stood together as the North Island came into view. We exchanged looks but no words. The moment had arrived....

Landfall!

The next 12 hours are little more than a blur. Words can hardly describe the ordeal involved in landing 2300 pounds of gear; dragging it up the hill lined with jagged rocks to reach the building before the wind and rain penetrated our packing cases. Exhausted and cold, we somehow stepped outside (into the now gale-force winds) to put up a few antennas so the deserving who had supported this expedition could get a CY9 QSO in their logbooks.

An R-7000 vertical, a 40-meter rotating dipole and 6-meter J-pole made it up before we reached the end of our endurance. Mike, our Team Leader, was concerned about hypothermia now that the temperature was low enough that we could see our breath.

We agreed that no one would get on the air until there was sufficient equipment in place so we all could share the joy of the first CQ. About midnight, the DXpedition became a reality for the waiting crowds. As expected, CQs weren't even necessary, as many alert DXers were waiting on our published frequencies, listening to our tune-ups. Many jumped the gun, but we didn't answer until we were all ready and Mike gave us the "GO!" The fun began—and what pileups they were!

Within an hour, however, we knew something was wrong: Incoming signals were weak and watery. One trip outside confirmed the fact that the northern lights were shining brightly...wreaking havoc on our precious propagation!

My memory of the next couple of days is pretty blank, save for a few operating highlights. It was cold and everything stayed wet with saltwater residue. The three of us did our best to deal with the less-than-cooperative radio conditions. We operated and we rested in brief fits of muscle-twitching sleep. We ate once a day whenever hunger pains would strike.

As the aurora died down, conditions improved. I think it was on our third day on the island before we all laughed simultaneously! We operated with a renewed sense of urgency as the high HF bands finally began to produce some Qs.

This treacherous "landing" amounts to little more than wood planks and beams atop jagged rocks.

We made only 275 QSOs on 6 meters despite an excellent QTH, tower, big Cushcraft beam, an IC-736, a 500-W amplifier, high-grade coax and a never-ending beacon calling into the ether on 50.101 MHz. Everyday we saw hours of European video on 48 MHz,

but we only heard the EH7KW/B beacon for about 10 seconds one day.

MM0AMW reported a snippet of our beacon, and we squeaked out a QSO with CT3FT. The most disappointing part of the whole trip was not making any 6-meter European QSOs. Many of our HF goals were realized, but not working any of the Europeans who had supported us so heavily was a major disappointment (although we did give W7RV his number 100 for 6-meter DXCC).

One particular highlight was being able to work more than 700 JA QSOs on 40, 20 and 30 meters. The JA pileups were awesome at times and provided Mike and me, the primary operators on those bands, with several happy on-air hours. A handful of YB and VK/ZL QSOs were also made—a stretch from the CY9 rock pile, indeed.

Meanwhile, Doug was struggling with 160-meter antenna challenges as the 160-foot beacon tower we had looked forward to using had disappeared before our arrival under somewhat murky circumstances. Doug had the foresight to bring two weather balloons and the gas to lift them, which proved to be the ticket to giving many 160-meter ops a new DXCC country.

I did what I do best—grind out QSOs hour after hour wherever the MUF was cooperative. Ultimately, we made almost 12,000 contacts. We could have made many more, but we stuck to our operating plan, which was to cover the bands that had the biggest need for CY9. My QSO rate meter hit 315 once, and Mike saw a 650-plus burst on 20-meter SSB.

The Trip Back—Another Storm!

On July 2 we received a radio message indicating that we would have to leave the following day. A bad storm was rushing in. We all grew silent as the time came to shut down and pack up for the return haul to our landing spot in the Tickle. We grabbed two hours of sleep. I ate a bag of trail mix, drank a Pepsi and began hauling stuff up over the jagged rocks. Mike and Doug worked on getting the antennas down and coiling up rope and coax.

About seven hours later, a new boat arrived to take us off the island as the *Heidi M* had followed the cod to the Newfoundland coast. The skipper of the *Greyhound* proved to be of the same cut as our first Captain. Three hours later, all the gear was aboard and we took a turn around St Paul's for one last look.

Gratefully, the trip home proved uneventful. As a matter of fact, we actually got sunburned after those days inside the dark interior of the old house! In Bay St. Lawrence we quickly unloaded our gear and made a beeline to the nearest restaurant, each ordering two-steak dinners! I'm sure we were quite a sight with our dirty, unshaven faces and fishy-smelling clothes.

Although we were totally exhausted, we drove straight back to Doug's house. Mike just missed disaster when a moose stepped in front of his car in the dark. The four-hour trip took seven hours because we had to pull over and sleep for a few hours on the way.

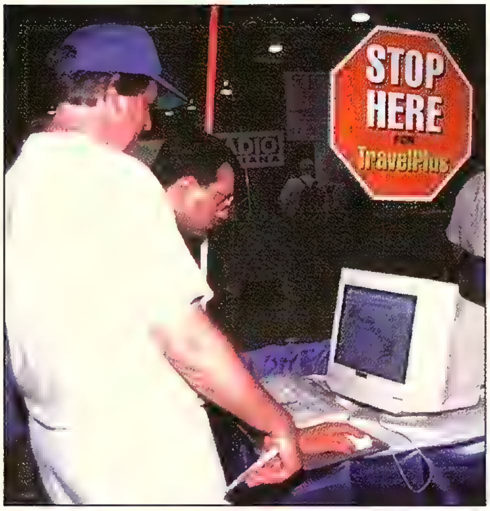
A few weeks after we returned, another Canadian group went to St. Paul's Island to operate. Doug, Mike and I found it less than humorous to read their post-expedition reports that described "tee-shirt and shorts weather" the whole while they were there.

Months later, Mike is working on getting all the QSLs answered after an unfortunate delay. I've been making less-exciting DXpeditions in the warmer climates offered in the Caribbean and staying very busy as the newest editor of the *National Contest Journal*. Not much has been heard from Doug, the trip's only bachelor. A very special woman seems to have stepped into his life and accomplished something no other woman ever has—making him put his headphones down for a while to pursue "other interests."

Don, VE1AOE, visited our departure port a few weeks after our adventure. He found that the story of our hardy trip was already part of the local folklore thanks to Captain Courtney.

Want an adventure like CY9AA? Pick your own "rock" and go for it!

For more information, contact the author at 4357 Appollonio Way, Carson City, NV 89704; e-mail **k7bv@aol.com**.



A DAYTON 1998 Pictorial

(Above, left) ARRL President Rod Stafford, W6ROD, speaks with one of the many visitors to the League's Hamvention booth. Others stopped by to see the latest version of the ARRL's *Travel Plus for Repeaters* CD-ROM (left), being demoed here by one of its developers, Alan Ambrose, N8DHF. Choose a route, and the software identifies all the repeaters along the way!

This dish advertises SSB Electronic's microwavewares, including a new linear amp for 1.2 GHz and modular local oscillator, and receiver and transmitter converter units for 10 GHz.

At the Dayton Hamvention flea market, where the ICOM Funmobile was set up (above right), thousands sought junk box bargains.

**Story and photos
by Rick Lindquist, N1RL**

Whether it's your first visit or your tenth, there's nothing quite like the Dayton Hamvention. For some it's a social experience; for others, a chance to be first on their block to get their hands on the newest toys the hobby has to offer. For first-timers, Dayton is a ham radio milestone.

But there's a practical side, too. Dayton is the time vendors debut their new wares. For those on the selling side of the hobby, Dayton provides a snapshot of the market. For the rest of us, it's a barometer of sorts to the hobby's mood.

Three days of fair weather and a largely enthusiastic crowd highlighted this year's event. Weather was in the mid to upper-80s for the first couple of days, and it was on the muggy side.

Perhaps reflecting renewed buoyancy in the hobby, Hamvention attendance this year was up slightly over last year—the official figure of 28,120 reverses a trend of declining attendance—but the jury's still out on whether the crowd was in a buying mood. It depends on whom you ask. According to Chris Lougee, N7TJM, of ICOM, buying was up this year. "The biggest change [from last year] was the interest in new HF products," he said. Lougee is among those who think the hot, humid weather might have held down traffic inside Hara Arena where the major dealers typically set up shop.

But ICOM also had its Funmobile, a 30-foot RV loaded with radio gear—and all of it working—set up in the flea market area, where it drew admiring glances and numerous visitors.

Mike Lamb, N7ML, of AEA/Tempo agreed with Lougee. "Friday started off with a bang, but Saturday dropped off, possibly because of the good weather outside," he said. Lamb said attendance seemed to be down from prior years, "but buying was good."

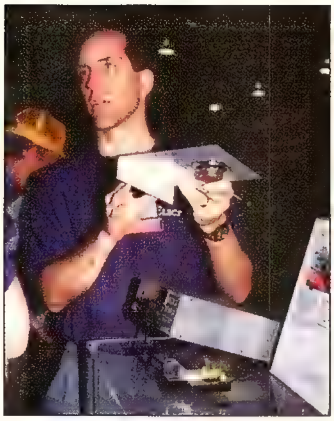
Also optimistic was Alinco's Doug Wynn, KB6YZD. "It was the best Dayton Hamvention ever for Alinco," Wynn said. Alinco introduced its DJ-C5T dual-band "credit card" radio at Dayton. Wynn called it "a big hit" and said "hundreds and hundreds of them were sold."

Similarly upbeat was Ten-Tec's Tom Salvetti, KC3NF. "We truly had our best Dayton ever. We sold more products than we ever have before." Salvetti said that interest in HF products "continues to be healthy."

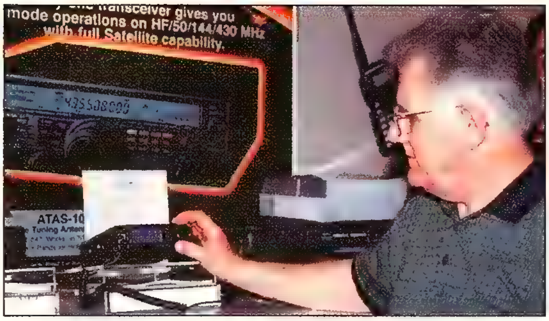
Kenwood's Paul Middleton, KD6NUH, felt sales in general were down. "Fewer boxes were seen in the hands of customers," he said.

Kantronics President Phil Anderson, WØXI, said the company's new KAM '98 single-port multimode data controller was well received. "I think it's safe to say that digital is making a huge comeback," he said.

Among the crowd were many overseas visitors, including Hans Berg, DJ6TJ, of the Deutscher Amateur Radio Club (DARC). "I've been to many Amateur Radio flea markets around the world," he wrote in his report for the DARC magazine *CQ DL*. "This was,



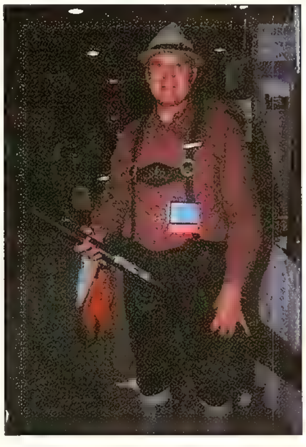
Noted QRPer Wayne Burdick, N6KR, of Wilderness Radio and NorCal renown, pops the hood off a prototype of the new EleCraft K2 HF transceiver kit. Burdick and Eric Swartz, WA6HHQ, designed the radio, to be on the market by fall. The basic 10 W CW version is expected to sell for $595. Add-ons will provide SSB and either higher power or an autotuner—your call.


mode operations on HF/50/144/430 MHz
with full Satellite capability.
ATAS-10

Ray Grenier, K9KHW, of AES spins the knobs on the new Yaesu FT-100 "Field Commander." Not expected to be available until late summer or early fall, the FT-100 covers all amateur bands and modes from 160 meters through 70 cm, with the exception of 222 MHz—all inside a box that's slightly smaller than the ICOM IC-706. It has a detachable front panel, CW keyer, DSP features, and slots for optional filters. Like the competing '706, the FT-100 will not offer full duplex for satellite work. Ten-Tec's Tom Salvetti, praised Yaesu for introducing "an exciting, innovative product." Yaesu also introduced its companion ATAS-100 Active-Tuning Antenna System for mobile or portable use. The antenna employs a motorized tuning system that automatically adjusts the unit's accordion-style bellows to the best SWR.

"Wow, just what I've been looking for!" A visitor to the Ten-Tec booth admires the new Titan II (Model 416) linear amp ($2990) being shown off by Ten-Tec's Ozzie Jaeger, W6AD. The single Svetlana 4CX1600B ceramic tetrode design provides full legal limit and has a self-contained power supply. Ten-Tec also demonstrated its soon-to-be-available "black box" computer-controlled HF receiver, the RX-320 ($295).

Top Band and antenna guru Tom Rauch, W8JI, of Ameritron shows off his company's wares—including the new "true legal limit" ATR-30 antenna tuner ($600)—to Rick Ingle, W9AK. Ameritron also displayed its new precision SWR/wattmeter, the AWM-30. Next door, MFJ offered its new MFJ-414 Classroom Morse Trainer ($200). The unit can fill a room with sound and has serial input/output and printer ports.



Walter Spieth, DK9SQ, demonstrates one of his telescoping fiberglass poles.

Ron Gould, K9HHY, checks out SGC's long-awaited SG-2020 "HF to go" compact transceiver at Dayton. The 160 through-10 meter unit, based on the popular Index New QRP Plus transceiver, runs 20 W and streets for around $600. In prototype form at Dayton was Patcomm's PC-9000, a compact 40-W box covering 160 through 6 meters (20 W on 6) that's expected to be available later this year. It offers a built-in keyer and a keyboard interface for CW and will sell for around $800. ADI also hopes to market a low-cost, lightweight HF transceiver under the Pryme label.

Doing it right: QRPers Enjoy "Four Days in May"

The typical low-power (QRP) operator will tell you that there's something about operating at flea-power levels that goes deeper than Amateur Radio itself. To be sure, there's lots of community spirit among QRPers—maybe more of it than within the hobby at large. But QRP operating also reflects a lifestyle, an attitude—doing more with less and, most times, doing it yourself. That mood was manifest at this year's "Four Days in May" (FDIM), an annual QRP gathering that conveniently coincides with the Dayton Hamvention.

Jim Kortge, K8IQY, shows off his prize-winning homebrew transceiver at the FDIM building competition. He built the 2.5 W transceiver in just a week.

Each year for the past three years, QRPers have gathered the day before the Dayton Hamvention gets under way for FDIM, sponsored this year for the first time entirely by the QRP Amateur Radio Club International. QRP ARCI President Mike Czuhajewski, WA8MCQ, describes it as "a four-day QRP extravaganza starting with a forum and followed by three days of wandering the Hara Arena and evening QRP events at the QRP Hotel," the Day's Inn Dayton South—about 10 miles from "the big show."

In typical QRP style, FDIM never will overpower the Hamvention. But as a parallel event—with its own forums and symposiums and even prize drawings—it's come into its own and established a tradition to bring together low-power ops from far and wide for a few days of camaraderie and learning and just plain enjoying the hobby.

Homebrewing and kit building are QRP mainstays. Any QRPer worth his or her salt has built at least one piece of equipment into an Altoids, Sucrets or StarKist tin and probably burned up a few 2N2222 transistors along the way. Saturday evening of the FDIM featured the fruits of the best homebrewers and kit builders in a building competition. Enthusiasts competed in the unlimited category sponsored by Chuck Adams, K5FO, or in the NorCal-sponsored 2N2222 transistor category. The idea behind the latter category was to pretend a worldwide cataclysm had destroyed much of civilization, but you still had a supply of 2N2222s (what Wayne Burdick, N6KR, called "the cockroach of electronic components"). You could use up to 22 of them, plus any number of diodes, to build a working transceiver. This year also featured a NorCal K8FF keyer paddle design event. The competition attracted more than 100 QRPers and a couple of dozen or so entries—up from last year. A few were even shipped in by contestants who couldn't make it.

Judging were Wayne Smith, K8FF; Wayne Burdick, N6KR; Dick Pascoe, G0BPS; and Gary Breed, K9AY—all legends within the QRP community. "It has been horrendously difficult this year," Pascoe said when the four were done evaluating the submitted handiwork. Top winners were K8IQY in the 2N2222 category, WB4TPW in the unlimited category (for his phasing method receiver), and KC5FMZ in the K8FF keyer paddle design event.

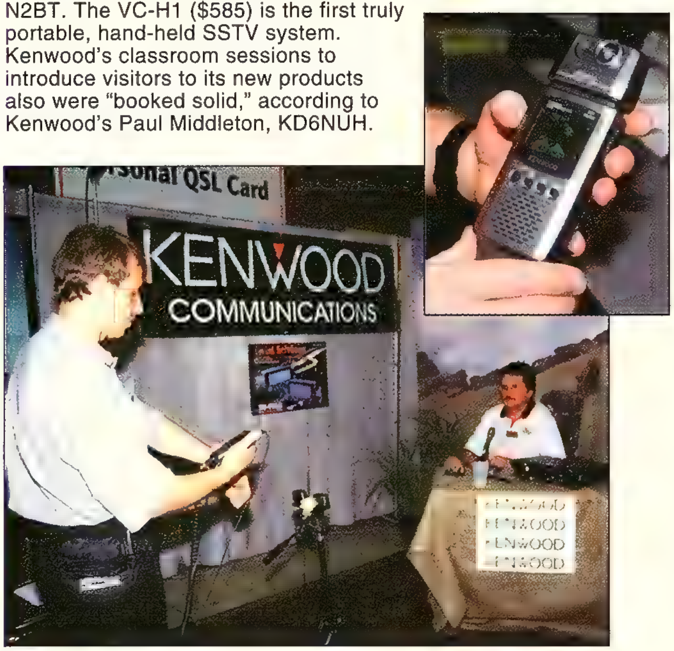
As *QRP Quarterly* Editor Ron Stark, KU7Y, likes to say, "If you're not having fun, you're not doing it right." They did it right at this year's FDIM.

Twelve-year-old John Pituch, W2MBY, won the FDIM drawing for an Emtech transceiver kit. John's old-timer's call sign used to be his grandfather's. His dad, Steven, is W2MY.

ICOM's new IC-Q7A dualband H-T offers wideband receive capability, from 30 to 1300 MHz in a very small package. The radio puts out around 300 mW. ICOM also debuted the lookalike IC-R2 scanning receiver at Dayton. Elsewhere, MAHA introduced 2-meter H-Ts under the Rexon label. ADI offered new H-Ts for 6 and 1¼ meters.

Last year, Alinco wowed the crowd with its "credit-card" H-Ts for 2 meters and 70 cm. This time, they debuted its thinner-is-better DJ-C5T ($250) dual-bander—only slightly larger and sporting a speaker, extended receive, and lithium-ion battery.

Say "cheese"! Kenwood's "Easter Island QSL" photo booth was a popular stop (and a chance to sit down and rest) for Hamvention visitors. Here, Kenwood's Steve Swalding uses the company's tiny new VC-H1 Visual Communicator SSTV system (right) to "snap" a photo of Hamventioneer Bill Thomas, N2BT. The VC-H1 ($585) is the first truly portable, hand-held SSTV system. Kenwood's classroom sessions to introduce visitors to its new products also were "booked solid," according to Kenwood's Paul Middleton, KD6NUH.



by far, the biggest." Berg said he was surprised to learn how many American hams have German roots.

While no "killer" product debuted this year to compare with last year's Kachina 505DSP transceiver, Yaesu may have trumped ICOM's popular IC-706Mk II with its new FT-100 "Field Commander" transceiver for 160 meters through 70 cm. To sort of even things out, ICOM reported a lot of interest in its new IC-Q7A mini H-T, intended to compete with the VX-1R that Yaesu debuted last year.

Several small HF transceivers priced well below the $1000 mark also turned up at Dayton this year.

But vendor Walter Spieth, DK9SQ, of Ebersbach, Germany hit one clean into left field with his telescoping fiberglass antenna poles. Spieth and his entourage, decked out in traditional Bavarian costume for their first-ever Dayton appearance, sold out of the 33-foot long lightweight masts—designed for temporary or portable antenna use. While at Dayton, he also made arrangements for US dealers to handle the product.

It's not too early to make plans for Dayton Hamvention 1999—it's May 14-16. See **http://www.hamvention.org**. QST

By Wes Hayward, W7ZOI, and Terry White, K7TAU

A Spectrum Analyzer for the Radio Amateur

Good tools are priceless when you need them. Here's a piece of test equipment you've always wanted for your workbench. Now you can have it—without spending a fortune.

Among the many measurement tools sought by the amateur experimenter, the most desired—but generally considered the least accessible—is the *radio-frequency spectrum analyzer* or SA. This need not be. Simple and easily duplicated, this home-built analyzer is capable of useful measurements in the 50 kHz to 70 MHz region. The design can be extended easily into the VHF and UHF region with methods outlined later. The instrument is configured to be self-calibrating, or capable of calibration with simple home-built test gear.[1]

We often read and hear about "simple designs." Simplicity implies that something is eliminated to make the equipment easier to build, use or afford. Unlike designs that sacrifice performance for cost and simplicity, this one sacrifices only convenience, while retaining the capabilities needed for accurate measurements.

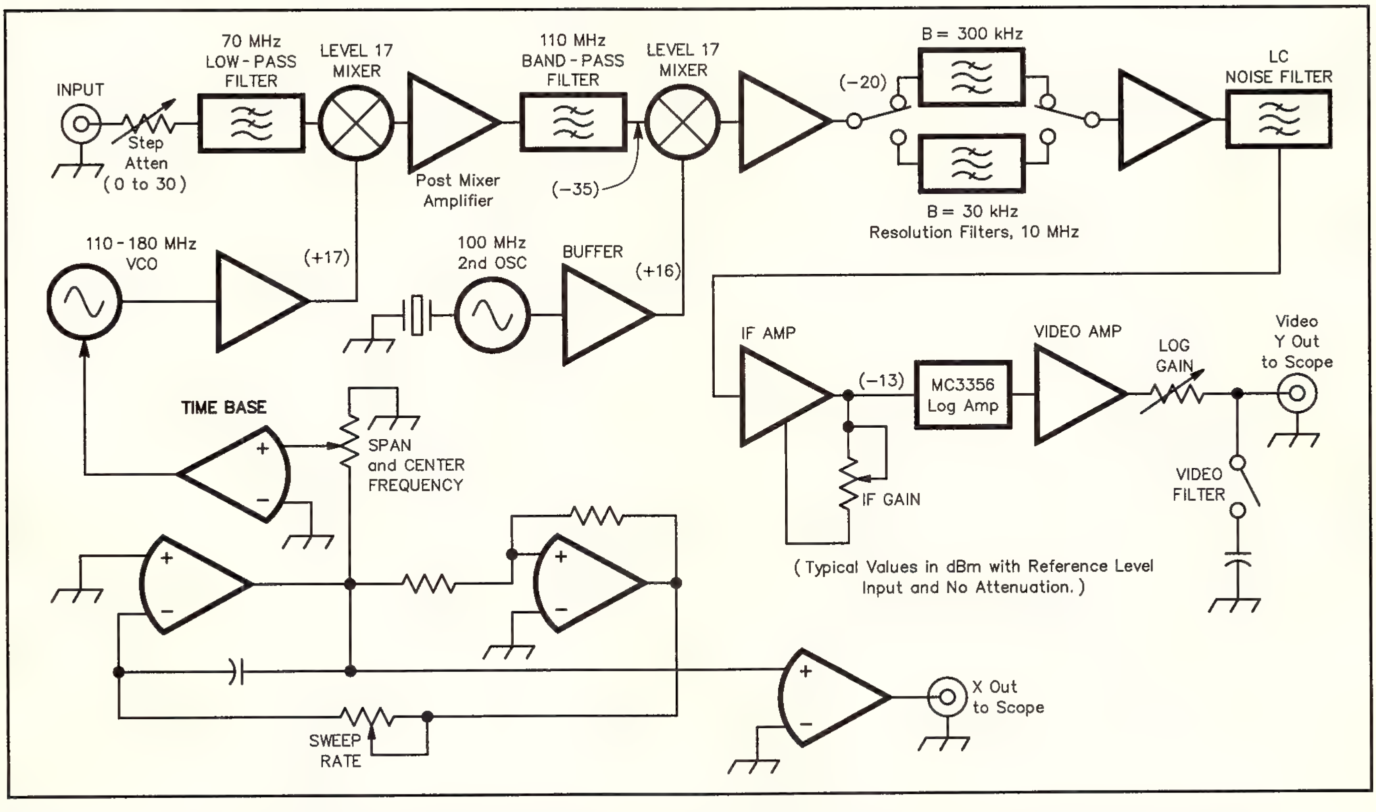


Figure 1—Block diagram of the spectrum analyzer. The circuit is a double-conversion superheterodyne design with intermediate frequencies of 110 and 10 MHz.

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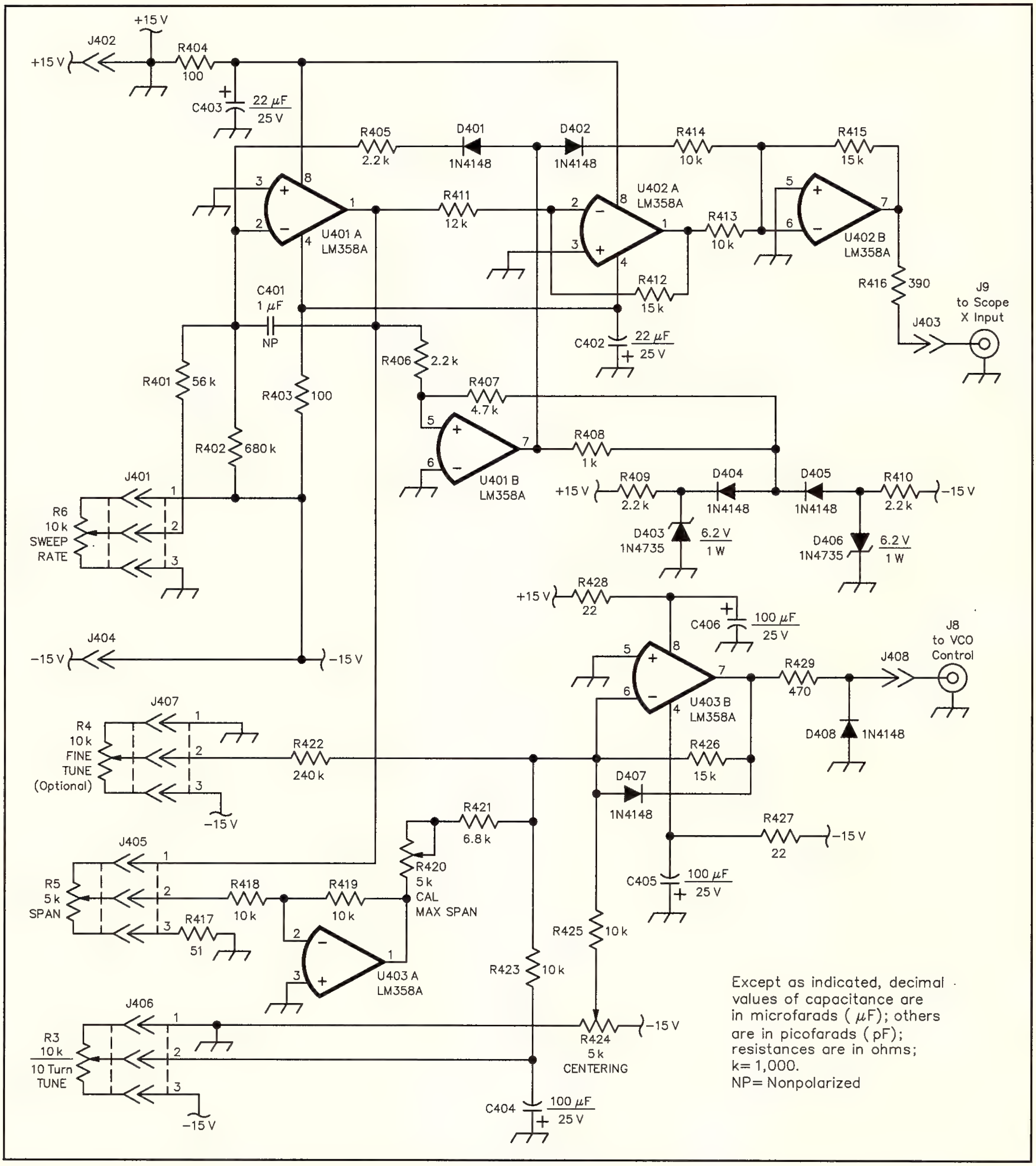
[1] Notes appear on page 43.



Except as indicated, decimal values of capacitance are in microfarads (μF); others are in picofarads (pF); resistances are in ohms; k= 1,000. NP= Nonpolarized

Figure 2—Time base for the spectrum analyzer. Refer to the text for a discussion of the various circuit functions. Front-panel controls include **SWEEP RATE, SPAN** and **TUNE**. Unless otherwise specified, resistors are 1/4 W, 5% tolerance carbon-composition or film units. Equivalent parts can be substituted.

U401, U402, U403—LM358 op amp
D403, D406—6.2 V Zener diodes, 1 W
C401—Metal film or Mylar, 1.0 μF capacitor
R420, R423—PC-mount trim pots, 5 kΩ or 10 kΩ suitable
R3, R4, R5, R6—Panel-mounted linear control, 5 kΩ or 10 kΩ suitable. If a 10 turn pot is used for R3, R4 is not needed.

Modern technology eases the construction of this spectrum analyzer. The logarithmic amplifier uses an IF amplifier IC found in cellular telephones and includes a *received signal strength indicator* (RSSI) function. Hybrid and monolithic IC building blocks are employed extensively. These include mixers, amplifiers and VCOs—all vital elements in an analyzer. Finally, it is a rare devoted experimenter today who does not own an oscilloscope. With good basic 'scopes available for about the price of a hand-held FM transceiver, every experimenter should have one. Our spectrum analyzer uses a 'scope as the display. There are no special requirements for 'scope performance other than an X-Y mode with dc coupling in the X and Y axes.

Some Spectrum-Analysis Basics

The RF spectrum analyzer is essentially a swept receiver with a visual display. The display shows the strength of all signals within a user-defined frequency span. Each signal is represented by a line or blip that rises out of a background noise, much like the action of an S meter. Commercial analyzers are calibrated for signal power, with all signals referred to a reference level at the top of the screen. Our analyzer is designed for a basic reference level of –30 dBm, a common value in commercial analyzers.[2]

Signal levels are read from the display by noting that power drops by 10 dB for each major division on the 'scope. You can change the reference level. Adding gain to the analyzer moves the reference to lower levels; introducing attenuation ahead of the instrument moves the reference to higher power levels.

Circuit Overview

Figure 1 is a block diagram of our spectrum analyzer. A double-conversion superheterodyne, it begins with a step attenuator, followed by a low-pass filter and the first mixer, where incoming signals are upconverted to a 110 MHz first IF. After some gain and band-pass filtering, a second conversion moves the signals to a 10 MHz IF. The resolution bandwidths available are 30 kHz and 300 kHz. A video filter smooths or averages noise. The available frequency spans range from a per-division maximum of 7 MHz to about 50 kHz. The center frequency can be adjusted over the entire 70 MHz range. An uncalibrated **SPAN** control allows expansion of the display about the screen center. An uncalibrated **SWEEP RATE** control allows the sweep to be controlled and matched to a given span while avoiding excessively fast scans that could introduce errors.

Ideally, a receiver's first IF should be greater than twice the highest input frequency, a design rule that we bend in this application. The input tuning range includes all HF amateur bands and 6 meters. (We'll discuss higher tuning ranges later.) We picked the 10 MHz second IF because surplus-crystal filters and LC filters for this frequency are easily built. You can easily adapt the design's IF to 10.7 MHz, or other close, convenient values.

The swept LO tunes from 110 to 180 MHz with a commercial VCO module. The VCO output is amplified to drive a high-level-input mixer. The commercial VCO is a recent modification to a design that started with a homebrew oscillator.[3]

Amplifiers are included at the 10 and 110 MHz IFs. These establish signal levels that properly match the log-amplifier window, while preserving system dynamic range. The proper distribution of gain, selectivity and signal-handling capability (intercepts) of the amplifiers and mixers is vital to achieving good performance in a spectrum analyzer, and indeed, any receiver. A proper design will have the same number of stages as a poor one, but will probably use different components and consume more current.

The analyzer uses a ±15 V power supply. The positive supply delivers about 0.5 A. The negative supply current drain is under 50 mA.

Following sections present the circuit blocks in greater detail, in the order that they should be built. The partial but growing system can then be used to test the other sections as they are built, turned on and integrated. We *strongly discourage* building the entire analyzer before testing specific sections. Such an approach may work for casual kits, but is *not suitable* when careful control of signal levels is required. That approach also robs you (the builder) of the excitement of the process: the learning that comes from detailed examination.

Before jumping into the circuit details, we reemphasize that this analyzer—although simple—is intended for *serious* measurements. This means that a normal maximum span display contains no spurious signals. When clean (well-filtered, harmonic-free) signals are applied to the analyzer, there should be *no* extra products as long as the signal level is kept on screen. This performance goal applies for a single tone, or for two equal signals at the top of the screen.

Time Base

Figure 2 shows the analyzer time base, designed for basic functionality without frills; the result is a circuit using only a handful of op amps.[4] U401A and U401B form a free-running sawtooth generator, a circuit commonly found in function generators. U401A operates as an integrator; current is pulled from the inverting input through a 56-kΩ resistor connected to the **SWEEP RATE** control. This current must flow through the capacitor (C401), creating a linearly changing op-amp output voltage. This ramp is applied to U401B, a regenerative comparator, which provides a reset signal to the integrator. The sawtooth waveform (pin 1 of U401A) is asymmetrical: The positive-going ramp grows with a slope determined by the front-panel-mounted **SWEEP RATE** pot, while the negative-going, faster reset ramp is determined by fixed-value components.

The U401 ramp is used twice. U402A and B process the ramp to generate a signal that drives the 'scope's X axis. The signal has a 0 V-centered range with just over a 10 V total swing. Some of the "square wave" from the basic time base (U401B, pin 7) is added to the input of U402B to cause the sweep to reset quickly, even though the return sweep for the VCO occurs in a more stable, smooth way. A slight overscan is generated for the X axis, serving to hide an aberration occurring near the sweep beginning.

The sweep also generates the signal that controls the VCO. The sweep signal (U401A pin 1) is applied to a **SPAN** control. When the analyzer is set for maximum span, the VCO voltage (about 2 to 10 V) generates a sweep from 110 to 180 MHz. The VCO uses only positive sweep voltages, so the output of U403B is diode-clamped to prevent negative output. The center frequency **TUNE**, **FINE TUNE** and a **MAX SPAN** calibration pot set up the proper sweep for maximum span. As the span is reduced with the **SPAN** control, the sweep expands on (or zeroes in on) whatever appears at the center of the screen, determined by the tuning. The center frequency must be set for 35 MHz at maximum span, which coincides with having the zero signal, or

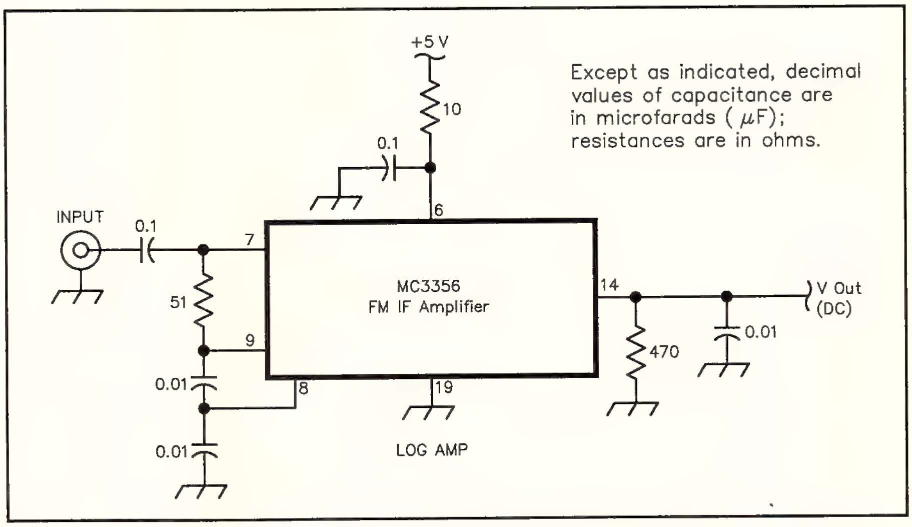

+5 V
10
0.1
Except as indicated, decimal values of capacitance are in microfarads (μF); resistances are in ohms.
INPUT
0.1
7
6
MC3356
FM IF Amplifier
14
V Out (DC)
51
9
470
0.01
0.01
8
19
0.01
LOG AMP

Figure 3—An experimental logarithmic amplifier breadboarded to evaluate performance prior to analyzer construction. You may want to duplicate this circuit and analyze its performance if you decide to use other log-amp ICs.

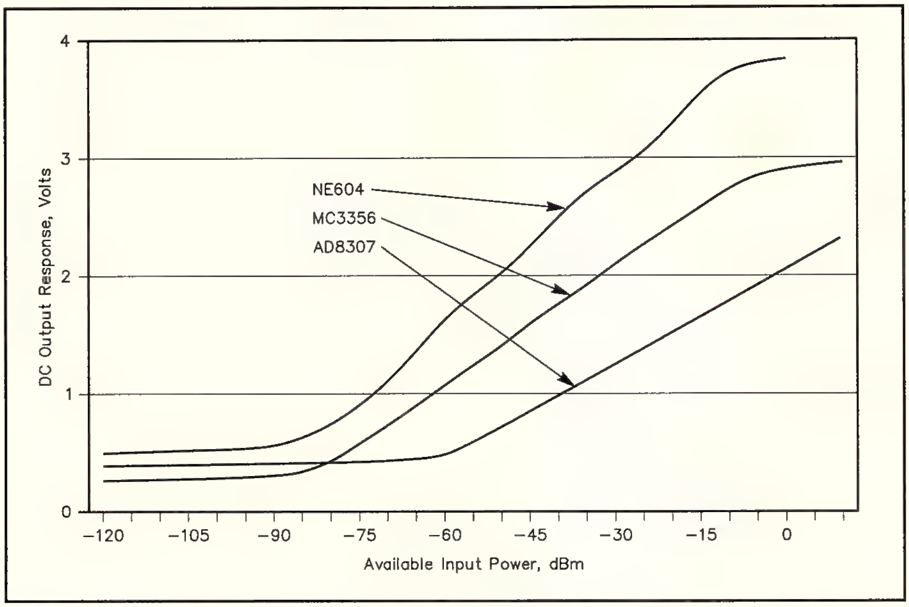


Figure 4—Transfer characteristics for three different logarithmic amplifier ICs. Although the MC3356 is used in our analyzers, use of the AD8307, shown in the lower curve, is recommended. Some curves have been linearly scaled to ease comparison.

"zero spur" at the left edge of the screen.

Setting up the time-base function is generally straightforward. The 'scope can be used to debug, check and study the circuits. The X-axis signal is a ramp ranging from –6 to +6 V with a reset to –15 V during the retrace. A similar ramp appears (without a reset pulse) at the VCO output, but with an amplitude dependent on the **SPAN** control setting.

Although the op amps are carefully bypassed, and the signal that tunes the VCO is shielded, most circuits are noncritical. Normal op-amp circuit precautions are taken with resistors injecting signals into inverting inputs positioned close to the op-amps.[5]

A 10-turn front-panel-mounted pot is used for the **TUNE** control (any value from 5 kΩ to 50 kΩ is suitable). A single-turn pot can be substituted if a 10-turn pot is not available. A fine-tuning function is included in this design, but may be omitted if a 10-turn pot is used for the main tuning.

Log Amplifier and Detector

Central to any spectrum analyzer is a *logarithmic amplifier*. The need for logarithmic processing becomes clear if we consider the range of signals we want to measure: At the low end, we may want to look at submicrovolt levels: under –107 dBm in a 50-Ω system. At the other extreme, we may want to measure the output of small transmitters, perhaps up to a power of 1 W, or +30 dBm. The difference between the two levels is 137 dB. The human ear is capable of handling linear ranges well over 60 dB.[6] This is a wide dynamic range world and linear displays, such as our screen, are inadequate unless some form of data compression or logarithmic processing is used.

The circuit element we use for this processing is the log amplifier.[7] The term is a misnomer, for the usual log-amp IC is both a logarithmic processor (amplifier) and a detector. The chips provide a dc output voltage that increases in proportion to the logarithm of the input amplitude. The central sensitivity specification for a log amp is a voltage slope that is equal to the voltage change (per decade or per decibel) of input-voltage-amplitude change.

An experimental log amp is shown in Figure 3. We breadboarded and tested this circuit to evaluate the log IC. To produce the MC3356 curve shown in Figure 4, the 10 MHz output of an HP-8654 signal generator was applied through HP-355 step attenuators. Exact dc output levels are insignificant, for they can be adjusted with dc voltage gain in a following amplifier. The salient detail that we observe is the dynamic input window. The MC3356, with a 50-Ω input termination, produces a nearly straight-line output voltage versus input power for inputs in the –80 to –10 dBm range. Hence, the analyzer log amp should operate with an input signal of –10 dBm for signals at the top of the screen.

We evaluated two other ICs. One, the commonly available NE/SA604, shows considerable ripple. The best performance offered came from a recently introduced chip from Analog Devices: the AD8307. This IC is designed specifically for measurement applications and offers outstanding logarithmic accuracy, a dynamic range exceeding 90 dB and better temperature stability than found with the usual cellular-receiver chips. The AD8307 requires a high drive level, so it must be preceded with higher-power amplifiers or impedance-transforming networks. The bandwidth of the AD8307 is about 500 MHz, so care is required in its use.

Our analyzer uses the inexpensive and readily available MC3356 log amp shown in Figure 5.[8] An op amp, U303, used to increase the signal output to 0.5 V per division, follows the log chip, U301. The 0 V level corresponds to the bottom of the screen; a signal of 4 V brings the response to the top of the screen. The op-amp output is slightly higher than this, but is then attenuated with a **LOG AMP CAL** control, R2. This pot should be accessible from the outside of the instrument.

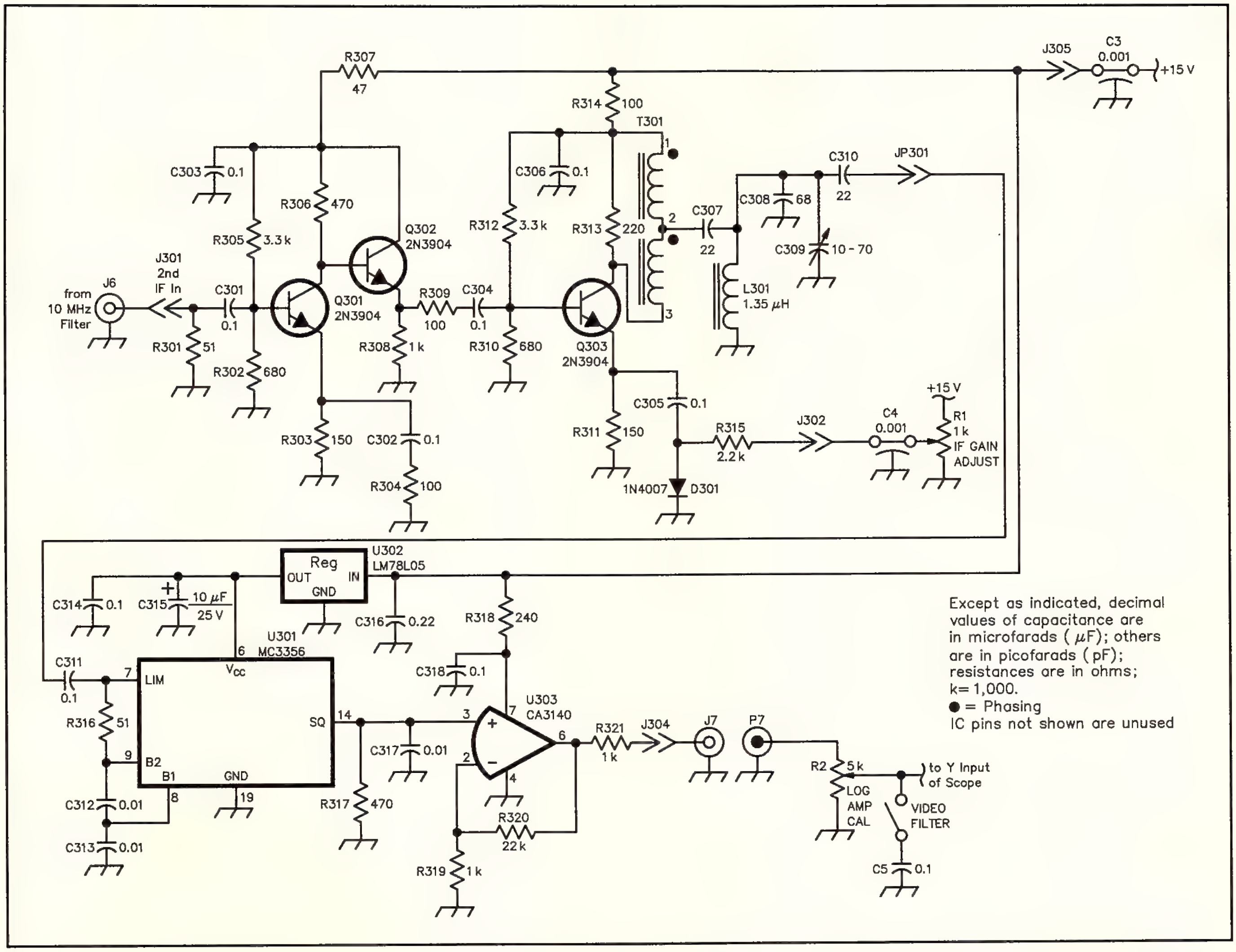
The log amp is preceded by an IF amplifier, Q301 through Q303. These stages are biased for relatively high-current operation to preserve linearity. Gain is controlled through variable emitter degeneration in the form of a PIN diode, D301. Most common 1N4000-series power rectifiers work well for gain control. The **IF GAIN ADJ** control (R1) should be available from the exterior of the RF-tight amplifier box. We have placed it on the front panel of our analyzers.

Calibration of the IF and log amplifier is straightforward. First, set the 'scope's Y axis to 0.5 V/division and short it. Set the now-working time base to drive the X axis and adjust the 'scope's vertical position control to place the horizontal line at the bottom of the screen. Inject a –10 dBm signal from a signal generator into the log amplifier input, remove the short circuit and adjust R2, **LOG AMP CAL**, for a full-screen (reference level) response. The input level is next reduced in 10 dB steps. The horizontal sweep line should drop down one major division for each 10 dB reduction over a 60 dB range. If this does not happen, repeat the procedure with a slightly different drive level. In our analyzers, a typical drive level of –13 dBm produced good accuracy.

Now, attach the IF amplifier to the log amplifier and drive them with an input level of –23 dBm. Peak the IF output filter for maximum response and set R1, **IF GAIN ADJ**, for a full-screen response. A true filter peak can be confirmed by varying the generator frequency. There is considerable extra range in the **IF GAIN ADJ**, providing extra flexibility during use.

Resolution Filters

Continuing the backward progression through the system, we encounter the resolution-bandwidth-determining filters. Our analyzer uses bandwidths of 30 and 300 kHz, provided by crystal and LC filters, respectively. The 300 kHz LC filter, the crystal filter and the relay circuitry for bandwidth switching are shown in Figure 6. Although shown as individual modules, they can be incorporated into one. The PC board for the filter includes the LC filter and switching relays with room for a user-selected crystal filter. Builders may want to implement their own scheme here. We



Except as indicated, decimal values of capacitance are in microfarads (µF); others are in picofarads (pF); resistances are in ohms; k= 1,000.
● = Phasing
IC pins not shown are unused

Figure 5—The 10 MHz IF amplifier and log amplifier used in the analyzer. Refer to the text for adjustment details. Unless otherwise specified, resistors are 1/4 W, 5% tolerance carbon-composition or film units. Equivalent parts can be substituted.

C309—Plastic dielectric trim cap (Sprague-Goodman GYD65000)
C307, C308, C310—Silver mica or NP0 ceramic capacitors, 10% tolerance
C316—0.22 µF ceramic
D301—PIN diode; 1N4007 used
L301—1.35 uH, 18 turns #24 enameled wire on T-44-6 core, Q >150
Q301, Q302, Q303—2N3904
R1—Panel-mount, 1 kΩ linear
R2—Panel-mount, 5 kΩ linear
U301—Motorola MC3356
U302—78L05 +5 V regulator
U303—CA3140 op amp

reasoned that builders would want to implement their own ideas. Maintain reasonable shielding for this part of the system. Additional attenuator pads can be inserted in line with one filter or the other to approximately equalize filter loss in the two paths.

You may want to build crystal filters for your analyzer.[9] The VCO stability in this analyzer will support resolution bandwidths as narrow as 3 to 5 kHz. For a simplified beginning, a very practical analyzer can be built with only one resolution bandwidth of 300 kHz.

Second Mixer and Second Local Oscillator

Figure 7 shows the second mixer and related LO. The heart of this module—and to some extent that of the entire analyzer—is U202, a high-level second mixer. This mixer is bombarded by large signals that are as strong or stronger than those at the front end. Accordingly, the second mixer should have an intercept similar to that of the first mixer. This is the usual weak point in all too many homebrew spectrum analyzers—as well as more than a few receivers! The second mixer, U202, uses a +17 dBm level Mini-Circuits TUF-1H. This is *not* the place for a current-starved telephone component! The second mixer is terminated in a high-pass/low-pass diplexer followed by an IF amplifier (Q202) biased at 50 mA. This is a critical stage for dynamic range: Don't replace it with a monolithic substitute of reduced gain or intercept.

The second LO begins with a 100 MHz, fifth-overtone crystal oscillator (Q201), followed by a pad and a power amplifier. The oscillator inductor, L201, in Q201's collector is made of five turns of #22 wire wound on a 6-32 machine screw. (Remove the screw before installing the coil.) Here's an excellent way to align the oscillator: Temporarily replace the crystal, Y201, with a 51 Ω resistor. Adjust the tuned circuit until oscillation occurs at the desired 100 MHz frequency. Then, replace the 51 Ω resistor with the 100 MHz crystal; no further tuning is required. Measure the oscillator's output with a power meter before applying it to U202. Adjust the pad attenuation (R205, R206, R207) to realize the specified LO drive level.

After the second LO is operating, attach it to the second mixer and the rest of the analyzer. With a second mixer input of –35 dBm at 110 MHz, you should obtain a reference-level response.

Voltage-Controlled Local Oscillator and First Mixer

Figure 8 shows the analyzer's swept LO. The foundation for this module is a Mini-Circuits POS-200 VCO module, U101. Similar VCOs are available from many

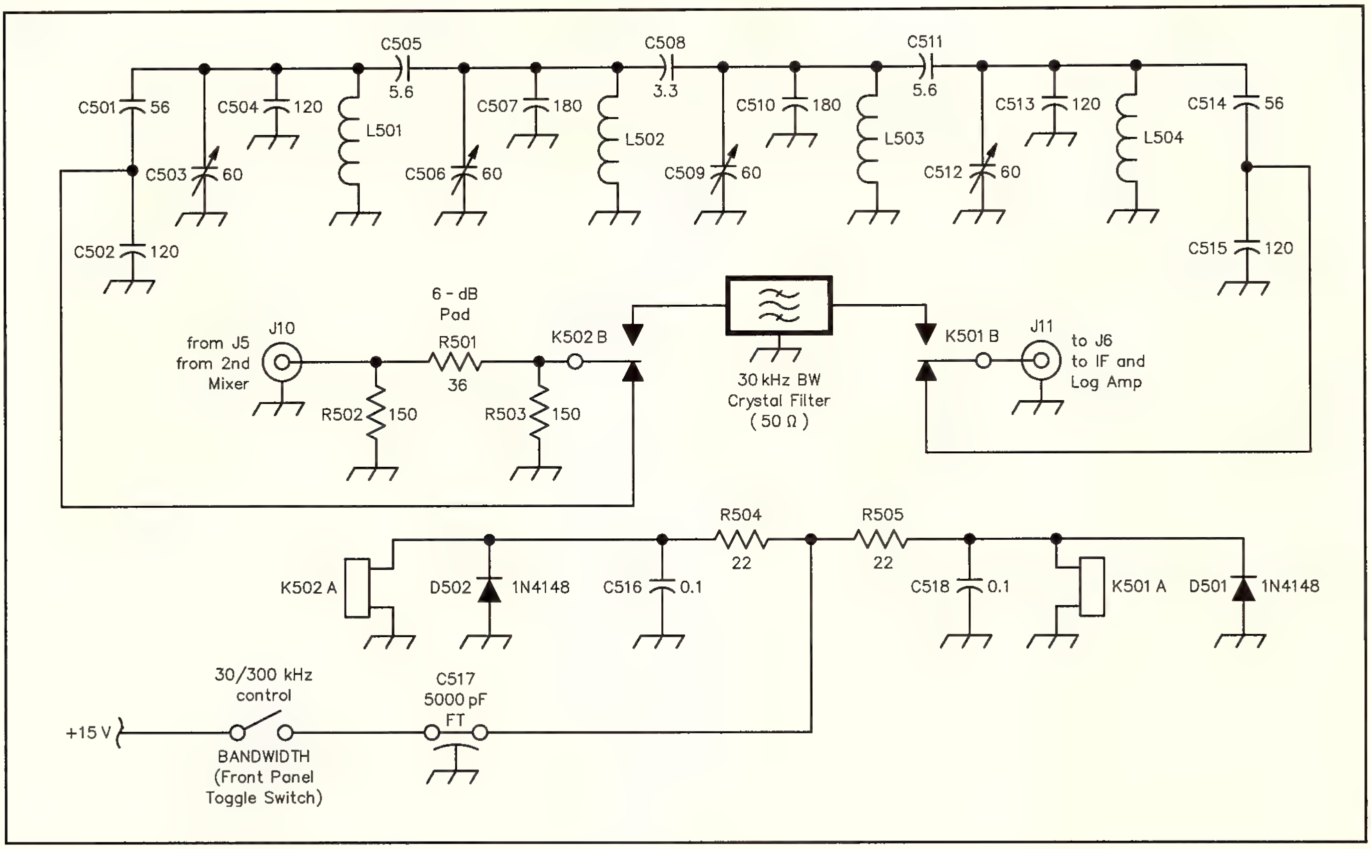


Figure 6—Resolution filters: The upper schematic shows the 300 kHz bandwidth 10 MHz LC filter. If desired, that circuit can be realigned at 10.7 MHz without other design changes. The LC filter is shown as a separate unit connected to the rest of the analyzer with coaxial cable. However, the filter can be constructed on the board with the crystal filter and relays. Unless otherwise specified, resistors are ¼ W, 5% tolerance carbon-composition or film units. Equivalent parts can be substituted.

C501, C502, C504, C505, C507, C508, C510, C511, C513, C514, C515—Silver mica or NP0 ceramic, 5%

C503, C506, C509, C512—65 pF plastic dielectric trim cap (Sprague-Goodman GYD65000)

K501, K502—SPDT relay; Aromat TF2-12V used here (one contact set unused); values of associated dropping resistors may need adjustment.

L501-L504—17 turns of #22 enameled wire on a T-50-6 toroid (1.15 µH), Q > 250

vendors.[10] The VCO output is about +10 dBm, too low a level for the high-level mixer. A MAV-11 amplifier, U102, preceded by a pad to provide level adjustment, increases the signal level. Confirm the output power level before applying it to the mixer, U103.

Once the VCO output level is adjusted and confirmed, calibrate its frequency against the VCO control voltage. If a VHF counter is not available, you can obtain a few points by tuning the VCO to hit local FM broadcast signals of known frequency. Calibrating the VCO is useful if the module is used later as a signal source for alignment of the 110 MHz band-pass filter.

Figure 8 also shows the input mixer, U103, another Mini-Circuits TUF-1H, terminated in a 6 dB pad. Although the pad degrades the noise figure, it presents a solid output termination for the mixer. This termination is reflected, helping to provide a good mixer-input impedance match, important in a measurement instrument. The pad is followed by a Mini-Circuits MAV-11 IF amplifier (U104) that restores the gain lost in the mixer and pad.

The mixer application differs from a normal diode ring: The RF input is now attached to the dc-coupled port. This allows input frequencies as low as 50 kHz to be converted to the first IF. The low-frequency end is limited by mixer LO to RF isolation, which determines the LO energy that reaches the first IF. The related on-screen response is often termed the *zero spur*, a familiar "feature" in most RF spectrum analyzers.

This module (VCO and first mixer) is contained in a shielded enclosure with coaxial inputs and outputs, including coaxial routing of the VCO control voltage. The front end is susceptible to any VHF and UHF signals reaching it, making shielding and decoupling especially important.

The 110-MHz IF Band-Pass Filter

One of the more-critical blocks in the analyzer is the filter that establishes the bandwidth of the VHF IF. The bandwidth must be at least as wide as the widest 10 MHz filter, but must be narrow enough to reject the 90 MHz second-conversion images by 80 dB or more. This performance is only available with a three-pole or higher-order filter. The best double-tuned circuits we built (or computer simulated) came close, but just didn't cut it.

We described double-tuned circuits in detail in a 1991 *QST* tutorial paper.[11] Those methods have recently been extended to three-resonator filters.[12] One of the methods presented in the later paper is a sequential approach that begins with a double-tuned circuit (DTC). First, a DTC is built for the desired 3 dB bandwidth and has its performance confirmed with a wideband sweep (a vital requirement!) Then, a third resonator is inserted between the original two. Coupling elements similar to the one that produced the required DTC bandwidth are repeated in the triple-tuned circuit, but end-section loading is not changed. The center frequency of the three resonators is aligned to complete the filter.

The schematic for the 110 MHz triple-tuned circuit is shown in Figure 9. The inductors, 100 nH, are made by winding 5 turns of #18 wire on the shank of a ¼-inch drill bit. These inductors typically have an unloaded Q of just over 200 at 110 MHz. Larger-diameter inductors would have produced higher unloaded Q with the attendant lower insertion loss. However, the

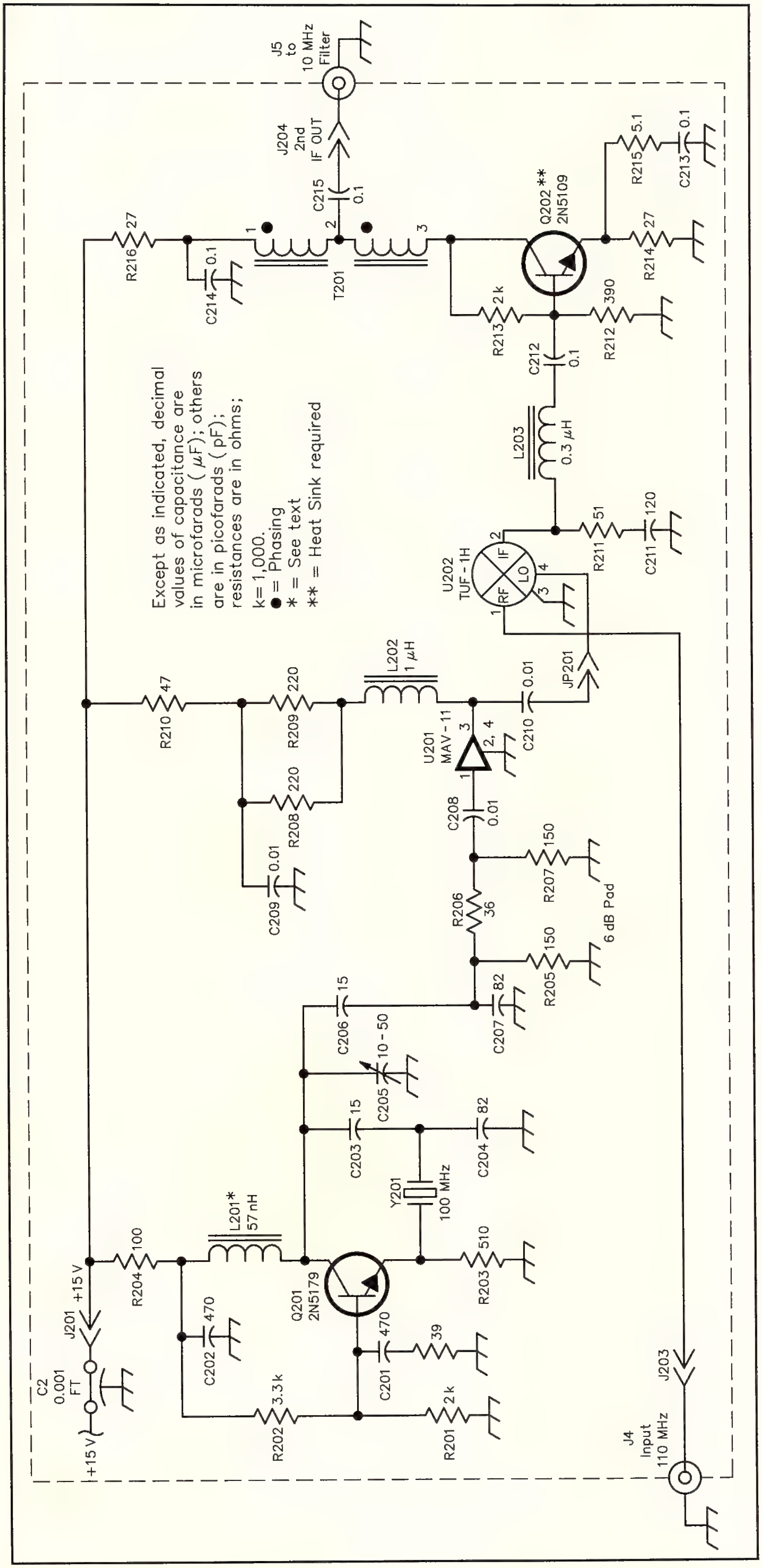


Figure 7—Second mixer and second LO. L203 in the output of U202 consists of 17 turns of #28 enameled wire on a T-30-6 toroid. The actual value is not critical and a molded RF choke can be used in place of the toroid. Unless otherwise specified, resistors are 1/4 W, 5% tolerance carbon-composition or film units. Equivalent parts can be substituted.

C201, C202—470 pF ceramic
C203, C206—15 pF NPO ceramic or silver mica
C204, C207—82 pF NPO ceramic or silver mica
C205—65 pF plastic dielectric trim cap (Sprague-Goodman GYD65000)
C211—120 pF, silver mica or NPO ceramic
L201—57 nH; 5 turns of #22 wire wound on a 6-32 machine screw. Remove the screw before installing the coil.
L202—1 μH molded RFC; any value from 100 nH to 2.7 μH is okay
L203—0.3 μH; 9 turns #24 enameled wire on a T-30-6 core
Q201—2N5179
Q202—2N5109, 2N3866, 2SC1252, etc
U201—Mini-Circuits MAV-11
U202—Mini-Circuits TUF-1H mixer
T201—10 bifilar turns #28 on FT-37-43 ferrite toroid

stray coupling between coils would have increased, which would have necessitated shields between filter sections. The smaller (10 nH) end-matching inductors are one-inch lengths of #18 wire. The triple-tuned filter, and its parent DTC, have bandwidths of 2 to 3 MHz.

The filter alignment and experimentation is usually done with a sensitive power meter,[13] a step attenuator and a signal source. As mentioned earlier, the VCO can serve the role of signal generator, if one is not available.

The second-conversion image rejection is easily measured with a finished analyzer. Apply a 40 MHz signal to the analyzer and adjust it for a reference-level response. Don't touch the analyzer tuning, but move the signal generator to 60 MHz. An image signal may appear at the same point on screen as the original 40 MHz signal. The rejection was only 66 dB with a DTC used for some experiments. The triple-tuned filter produced 90-dB rejection. The slight extra effort of the triple-tuned circuit is easily justified. No PC board is available for the IF filter.

Input Low-Pass Filter

A 70 MHz low-pass filter is shown in Figure 10. This circuit and a step attenuator are housed in separate shielded enclosures in one of our analyzers. In the other, the filter and the attenuator remain outboard elements. Integral components are more convenient for routine analyzer applications, but incorporation removes them from the equipment pool available for other experiments. Also, operation without an outboard low-pass filter allows the instrument to be

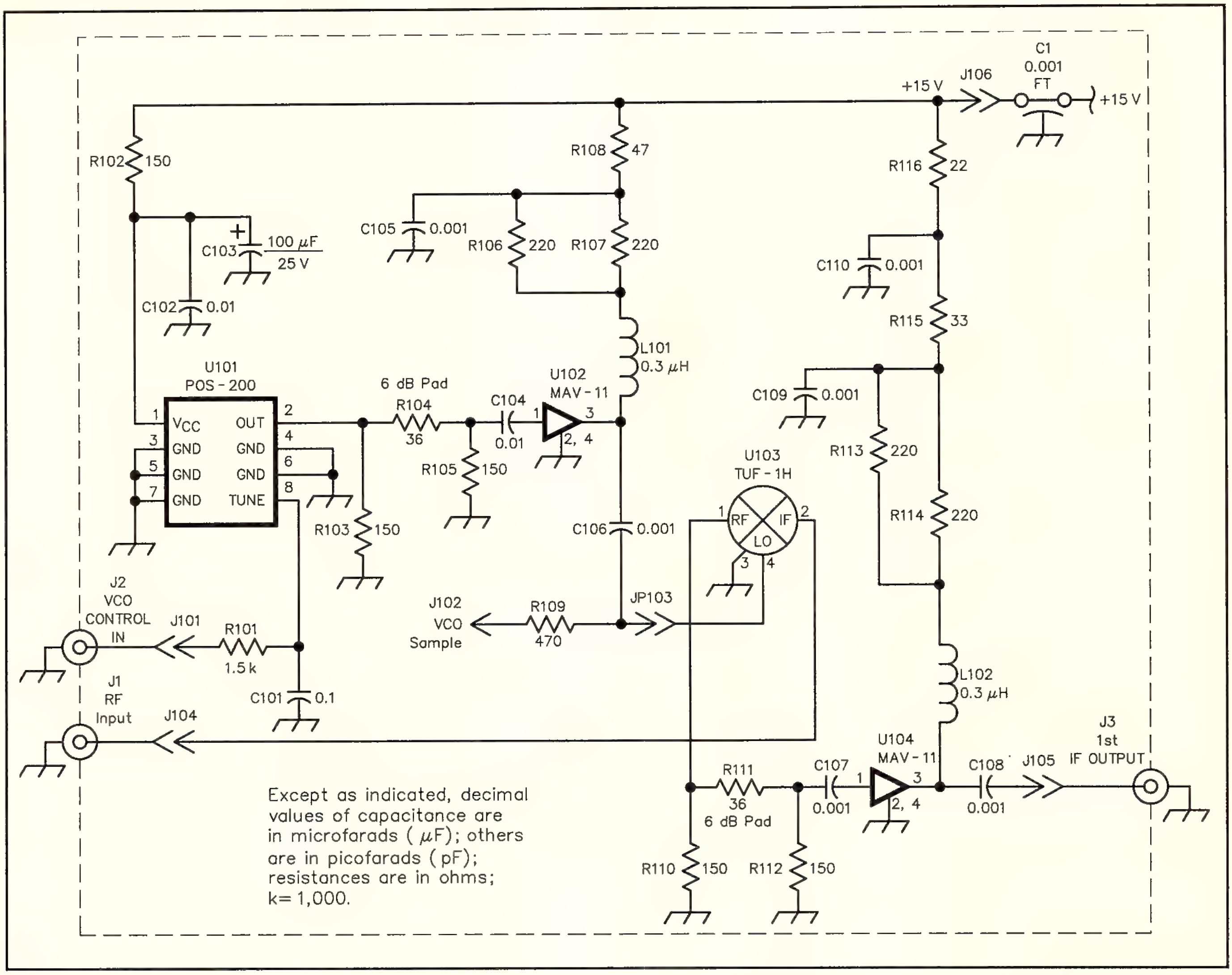


Figure 8—Front-end for the spectrum analyzer. The LO drive level is set to between +16 and +18 dBm by trimming the pad attenuation. The 1 µH inductors used in the MAV-11 outputs can be molded RF chokes or made of 17 turns of #28 enameled wire wound on T-30-6 toroids. Unless otherwise specified, resistors are ¼ W, 5% tolerance carbon-composition or film units. Equivalent parts can be substituted.

L101, L102—1 µH molded RFC; any value between 100 nH to 2.7 µH suitable

U101—Mini-Circuits POS-200 VCO

U102, U104—Mini-Circuits MAV-11

U103—Mini-Circuits TUF-1H

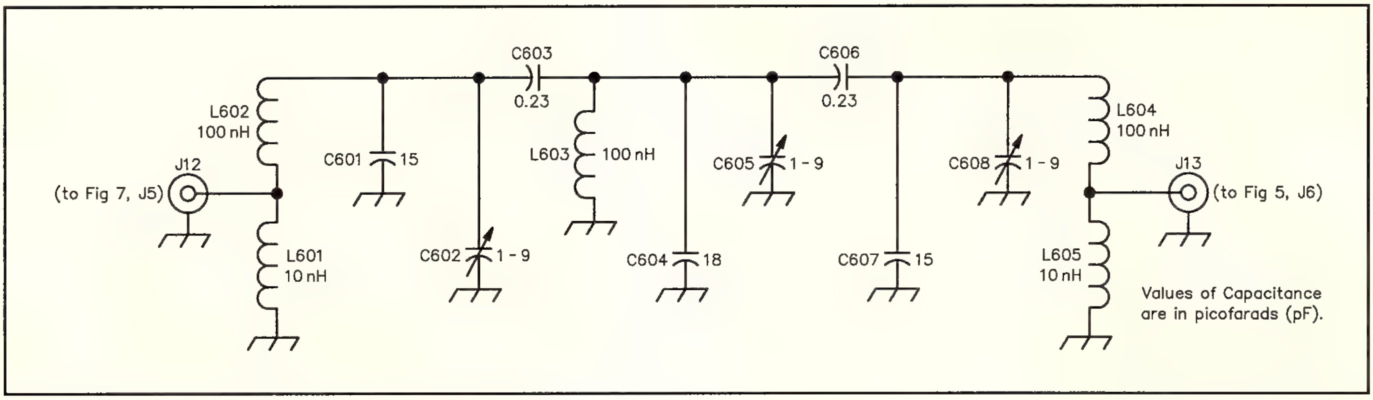


Figure 9—VHF band-pass filter used in the 110 MHz IF.

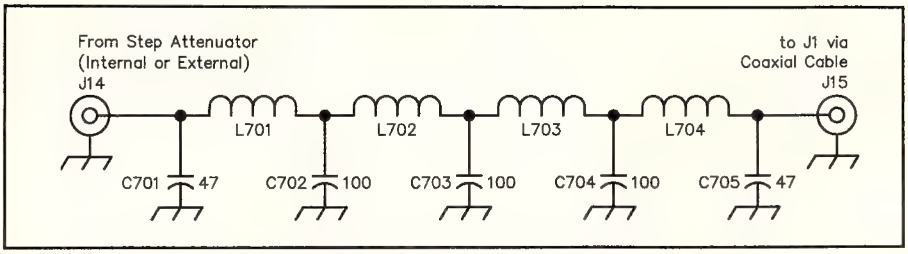


Figure 10—Input 70 MHz low-pass filter. The filter started as a ninth-order Chebyshev design, but was modified through computer manipulation to use equal-value inductors and standard-value capacitors. The inductors each consist of 8 turns of #22 wire. The wire is wound on the threads a 1/4-20 bolt as a form; remove the bolt after winding the inductor. See text.

C701-C705—NP0 ceramic, 5% tolerance.

L701-L704—8 turns #22 bare wire wound in 1/4-20 bolt threads; see text.

used well into the low UHF area by operating the mixer with VCO harmonics. (No circuit boards are available for this filter.)

Construction and Adjustment Hints

The spectrum analyzer can be built using a number of RF techniques. Our analyzers are collections of small boxes using coaxial-cable interconnections. Power supplies reach the interior of RF modules through feedthrough capacitors. The only open boards in the system are the time base and (in one instrument) the log amp, both constrained to low frequencies. The 110 MHz IF filter and all RF circuit boards are designed to fit in Hammond 1590B diecast aluminum alloy boxes.

The sensitivity of such RF measurement equipment justifies the extensive shielding. Spurious responses are readily seen on the display. While a few can be tolerated, they seriously detract from a measurement when, for example, spurious transmitter products are being examined.

Most of the adjustment has already been discussed. Indeed, by the time the analyzer is finished, there is little alignment left! The block diagram (Figure 1) has typical signal levels shown in parentheses.

The finished analyzer is set up with a –30 dBm signal from a stable-impedance source. Adjust the IF gain to establish the reference level. If the 10 dB per division tracking is not quite correct, change the log amp gain, followed by a readjustment of the IF gain until tracking is correct. IF gain is adjusted to the reference level whenever the analyzer is used.

Next month, we'll present methods to extend the analyzer to higher frequencies. We'll discuss simple test equipment that can be used in alignment and present some typical examples of spectrum-analyzer use.

Wes Hayward, W7ZOI, and Terry White, K7TAU, are not strangers to QST. *This is also not the first* QST *project on which they've worked together. The first, "The Mountaineer—An Ultraportable CW Station," described a QRP transceiver and appeared in the August 1972 issue. At the time this spectrum-analyzer project evolved, the authors worked together in the Advanced Circuits section of the Receiver Group at TriQuint Semiconductor in Hillsboro, Oregon. Over the years, Wes has provided readers of* QST, The Handbook *and other ARRL publications with a wealth of projects and technological know-how. You can contact Wes at 7700 SW Danielle Ave, Beaverton, OR 97008; e-mail* **w7zoi@teleport.com**. *Terry can be reached at 9480 S Gribble Rd, Canby, OR 97013; e-mail* **twhite@tqs.com**.

Notes

[1] Homebrew analyzers described in amateur literature in recent years have often used TV tuners as the front end. See, for example, Al Helfrick, K2BLA, "An Inexpensive Spectrum Analyzer for the Radio Amateur," *QST*, Nov 1985, pp 23-29. A more recent example is Fred Brown, W6HPH, "Build a 5- to 850-MHz Spectrum Analyzer," *Communications Quarterly*, Winter, 1997, pp 91-96.

[2] The usual unit for power measurement with a spectrum analyzer is dBm. This is an absolute, impedance invariant unit, signifying power compared with 1 mW. Hence, –30 dBm is 30 dB below a milliwatt, or a microwatt. The dBm unit is especially useful in spectrum analysis where two levels are often compared. The difference between two powers in dBm is a power ratio in dB. (See Jay Craswell, WB0VNE, "Converting Between dBm, Milliwatts and Watts," Technical Correspondence, *QST*, Jul 1998, p 70.—*Ed.*)

[3] Excellent homebrew VCOs can be built using the work of Allan Victor, WA4MGX, "Wideband VCO Design," *Ham Radio Magazine*, Jul, 1984, pp 49-58. See also the recent work of Colin Horrabin, G3SBI, as reprinted in "Tech Notes," *Communications Quarterly*, Winter, 1996, pp 94-104.

[4] Many amateurs are uncomfortable with op-amp circuits, a situation easily remedied by a study of the excellent text by Horowitz and Hill, "The Art of Electronics," 2nd Edition, Cambridge University Press, 1989. See the golden rules presented on page 177. An op-amp integrator is presented on page 222. The information on sawtooth oscillators beginning on page 288 is also useful.

[5] PC boards for several of the analyzer circuits are available from Kanga USA. Details are available at the Kanga Web site, **http://www.bright.net/~kanga/kanga/**, or from Kanga USA, 3521 Spring Lake Dr, Findlay, OH 45840.

[6] The best digital audio recording and playback systems have a dynamic range around 90 dB.

[7] An outstanding fundamental treatment of log amps is given in applications data from Analog Devices. See, for example, the data sheet for the AD8307, Analog Devices, Norwood, MA, 1997, **http://www.analog.com/product/Product_Center.html**.

[8] The log/IF board available from Kanga (see Note 5) is configured for the MC3356. Most of the 20 pins allotted to the IC are not used and their locations can be employed to breadboard and retrofit the AD8307 (8 pin DIP) into the system, if desired.

[9] If crystal filters are built especially for this project, we recommend a peaked response shape (such as Gaussian-to-6 dB). We have investigated wider bandwidth crystal filters as presented in Wes Hayward, W7ZOI, "Refinements in Crystal Ladder Filter Design," *QEX*, Jun, 1995, pp 16-21. See also the careful work of Bill Carver, "High Performance Crystal Filter Design," *Communications Quarterly*, Winter, 1993, pp 11-18, and that of Jacob Makhinson, N6NWP, "Designing and Building High Performance Crystal Ladder Filters," *QEX*, Jan 1995, pp 3-17.

[10] See the Mini-Circuits catalogs and applications manuals. A family of viable VCOs are also available from Synergy Microwave. These units are more expensive, but offer lower phase noise, which would be significant for more-stringent applications.

[11] Wes Hayward, W7ZOI, "The Double Tuned Circuit: An Experimenter's Tutorial," *QST*, Dec 91, pp 29-34.

[12] Wes Hayward, W7ZOI, "Extending the Double-Tuned Circuit to Three Resonators," *QEX*, March-April, 1998, pp 41-46.

[13] Denton Bramwell, K7OWJ, "The Microwatter," *QST*, Jun 1997, pp 33-35. Also, see the sidebar in the referent of Note 11.

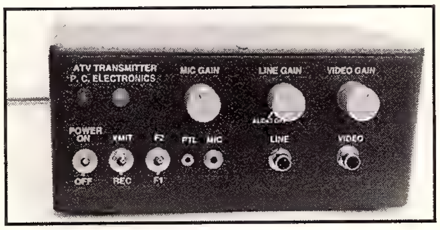
New Products

ATV TRANSMITTER FROM PC ELECTRONICS

◊ The TX70-10 ATV transmitter from PC electronics is aimed at operators who use cable-ready TVs (tuned to channels 57-60) to receive amateur television signals in the 70-cm ham band. The continuous-duty transmitter puts out 10 W AM (color or black-and-white, just like broadcast TV stations) and features a built-in T/R relay, variable power output, front-panel RCA jacks for video and audio (with line and mic inputs), a video monitor circuit and a PTL jack (push-to-look) in parallel with the unit's T/R switch.

The TX70-10 is housed in a die cast aluminum box measuring about 7×5×3 inches and is powered by 13.8 V dc at 3 A. The unit comes with one user-specified crystal in the 440-MHz range. An optional second front-panel-selected crystal is available for $20. A repeater version, the RTX70-10, is also available.

Price: $439 shipped to the lower 48 states. For more information, contact PC Electronics, 2522 Paxson Ln, Arcadia, CA 91007; tel 626-447-4565; **tomsmb@aol.com**.



By Robert H. Johns, W3JIP

Build a Portable Antenna

Can't work daytime skip? Take your rig on vacation! This HF/VHF antenna mounts anywhere, packs well and works like a champ.

This dipole antenna can be used for any band from 80 through 2 meters. One half of the dipole is an inductively loaded aluminum tube. Its length is adjustable from 4 to 11 feet, depending on how much room is available. The other half is flexible insulated wire that can be spooled out as necessary. The tube is supported by a flagpole bracket attached to a long carpenter's clamp. The clamp mounts the antenna to practically anything: a windowsill, railing, a chair or post. If there is no structure to mount the antenna (a parking lot or the beach), the clamp attaches to two light wooden legs to form a tripod.

The key to mounting flexibility is the large clamp. The key to electrical flexibility is a large adjustable coil that lets you resonate the tube on many bands. The coil is wound with #8 aluminum ground wire from Radio Shack. The form is a four-inch ($4^1/_2$-inch OD) styrene drain coupling from The Home Depot or a large plumbing supply store. A movable tap adjusts the inductance to tune the upright tube to the desired band. The wire half of the antenna is always a bit less than $\lambda/4$ on each band. Hang it from any convenient support or drape it over bushes to keep it off the ground.

Construction

The 18-inch carpenter's clamp (sometimes called a bar clamp, such as Jorgensen's No. 3718) and flagpole bracket that takes a $^3/_4$-inch pole are common hardware items. The bracket is insulated from the clamp jaw by a $1^1/_2$-inch length of 1-inch PVC pipe (see Figure 2). Hammer the PVC over the end clamp jaw to make it take the shape of the jaw. Secure the flagpole bracket to PVC with a large ground clamp (for $^1/_2$ or 1-inch conduit). The ground clamp includes $^1/_4$-inch bolts; enlarge the flagpole bracket holes to accept them. Some flagpole brackets have an integral cleat; I hammered the cleat ears flat on mine.

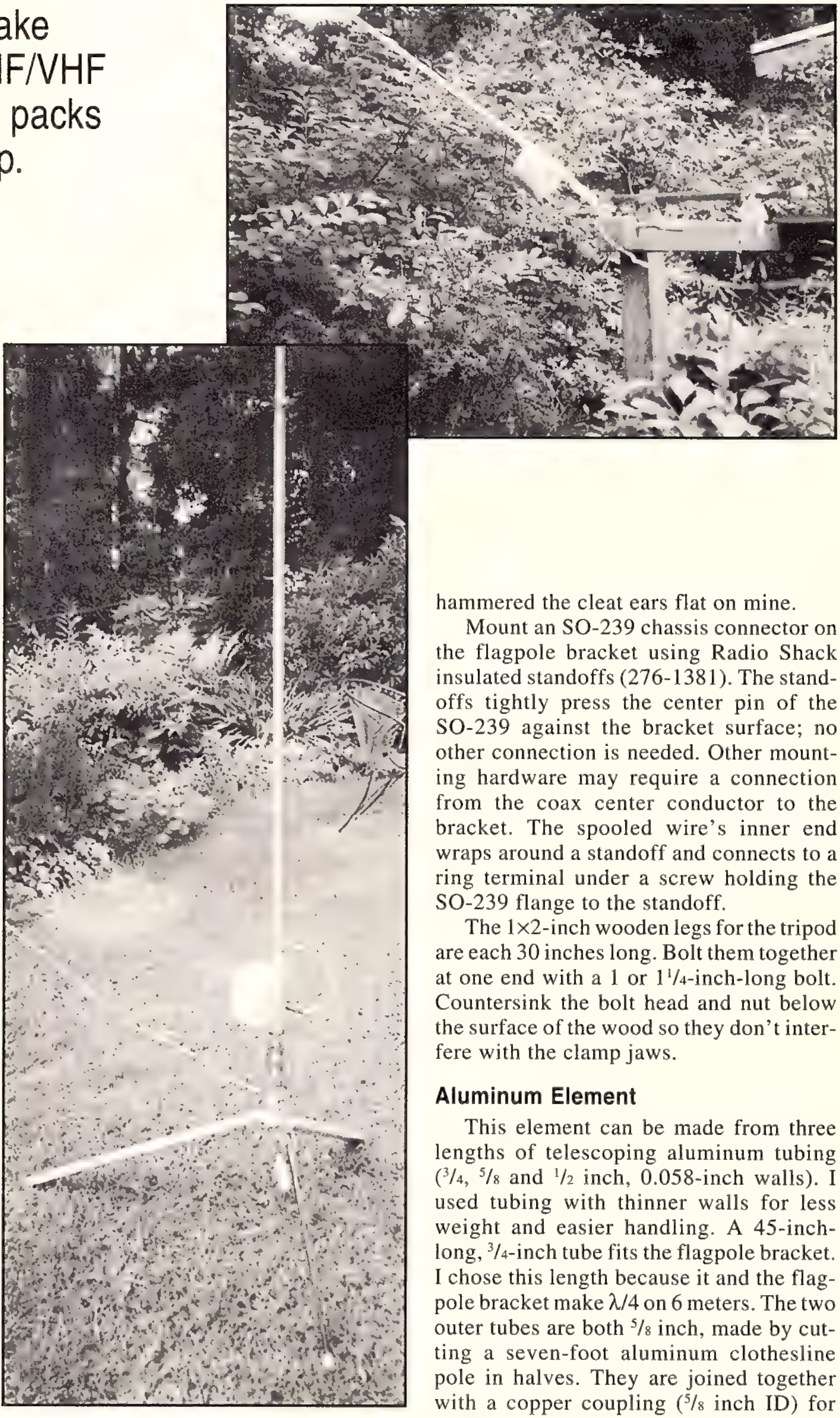


Figure 1—The portable antenna in some of the many places it may be mounted around the house, porch and yard.

Mount an SO-239 chassis connector on the flagpole bracket using Radio Shack insulated standoffs (276-1381). The standoffs tightly press the center pin of the SO-239 against the bracket surface; no other connection is needed. Other mounting hardware may require a connection from the coax center conductor to the bracket. The spooled wire's inner end wraps around a standoff and connects to a ring terminal under a screw holding the SO-239 flange to the standoff.

The 1×2-inch wooden legs for the tripod are each 30 inches long. Bolt them together at one end with a 1 or $1^1/_4$-inch-long bolt. Countersink the bolt head and nut below the surface of the wood so they don't interfere with the clamp jaws.

Aluminum Element

This element can be made from three lengths of telescoping aluminum tubing ($^3/_4$, $^5/_8$ and $^1/_2$ inch, 0.058-inch walls). I used tubing with thinner walls for less weight and easier handling. A 45-inch-long, $^3/_4$-inch tube fits the flagpole bracket. I chose this length because it and the flagpole bracket make $\lambda/4$ on 6 meters. The two outer tubes are both $^5/_8$ inch, made by cutting a seven-foot aluminum clothesline pole in halves. They are joined together with a copper coupling ($^5/_8$ inch ID) for $^1/_2$-inch copper pipe. The coupling is bolted to one of the $^5/_8$-inch sections, and a slot is cut in the free half of the coupling. The

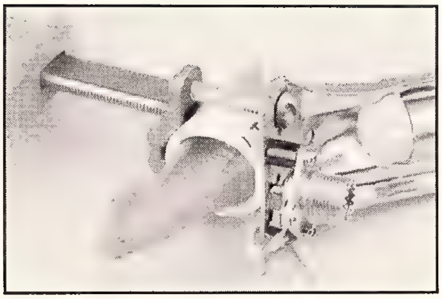


Figure 2—The flagpole bracket that supports the tubing elements is clamped to the long carpenter's clamp, but insulated from it by a small section of 1-inch PVC pipe. A coax connector is mounted to the bracket and the spool of wire is attached to the coax connector.

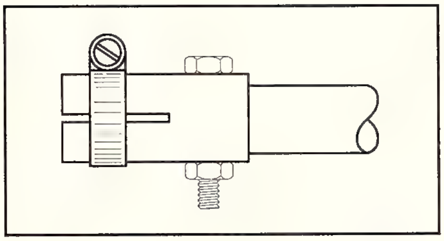


Figure 3—The joint between two sections of $^5/_8$-inch tubing is made from a $^1/_2$-inch copper pipe coupling, bolted to one section and hose clamped to the other.

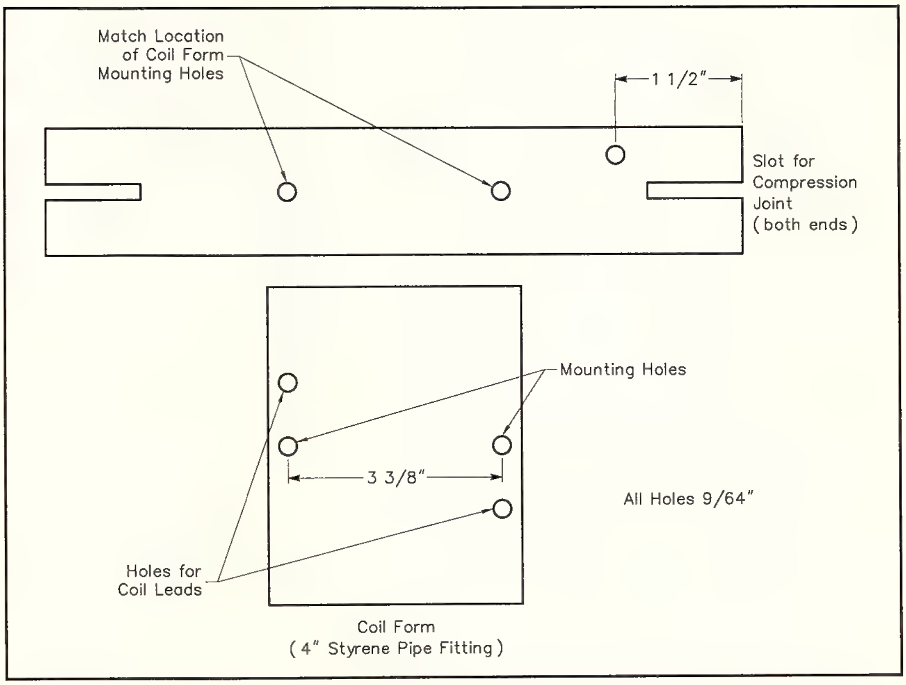

Match Location of Coil Form Mounting Holes
1 1/2"
Slot for Compression Joint (both ends)
Mounting Holes
3 3/8"
All Holes 9/64"
Holes for Coil Leads
Coil Form
(4" Styrene Pipe Fitting)

Figure 4—Holes to be drilled in the styrene coupling and the $^3/_4$-inch PVC pipe. All holes are $^9/_{64}$-inch diameter, to provide clearance for #6-32 bolts. The hole 1$^1/_2$ inches from one end holds a bolt that serves as a stop, so that the antenna tube does not slide in too far. Space the holes for coil leads far enough from the mounting holes to clear the $^3/_4$-inch pipe.

remaining $^5/_8$-inch tube is inserted there and secured with a hose clamp. See Figure 3.

One $^5/_8$-inch tube slides into the $^3/_4$-inch tube to provide a continuously variable element length from about 4 to 7$^1/_2$ feet. This extends from 7$^1/_2$ to 11 feet when the two $^5/_8$-inch sections are joined together.

Loading Coil

The loading coil has 12 turns of bare aluminum wire spaced to fill the 3$^1/_2$-inch length of the drain coupling. Drill $^9/_{64}$-inch holes at the ends of the coil form to accept the ends of the coil wire. (See Figure 4.) To wind the coil, feed four inches of wire through the form, make a sharp bend in the wire and start winding away from the nearby mounting hole. Wind 12 turns on the form, spacing them only approximately. Cut the wire for a 4-inch lead and feed it through the other hole in the form. Tighten the wire as best you can and bend it into another acute angle where it passes into the form. Space the turns about equally, but don't fuss with them. Final spacing will be set after the wire is tightened.

Tighten the coil wire by putting a screwdriver or a needle-nose pliers jaw under one turn, and pry the wire up and away from the surface of the coil form. This can be done anywhere but I prefer these kinks on the backside, away from the mounting shaft. Put kinks in every other turn. This removes any slack from the coil and holds the turns in place. Should the coil ever loosen, simply retighten it with a screwdriver. If you prefer, glue the coil turns in place with epoxy or coil dope. Use a thin bead of glue that won't interfere with the clip that connects to the coil.

The coil form mounts on a nine-inch-long $^3/_4$-inch PVC pipe.[1] (See Figures 4 and 5.) The inside diameter is slightly larger than the $^3/_4$-inch aluminum, but slotting the PVC and tightening it with a hose clamp secures the tube. (Use a wide saw to cut these slots, not a hacksaw.) The coil form mounts to the PVC pipe with #6-32× 1$^1/_2$-inch bolts. A five-inch long, $^3/_4$-inch aluminum tube permanently attaches to one end of the coil assembly and slides into the flagpole bracket. One end of the coil wire connects to this short tube. Flatten the wire end by hammering on something hard, then drill a $^9/_{64}$-inch hole in the flattened end and attach it to the short tube with a #6-32×1-inch bolt. Tighten the bolt until the $^1/_2$-inch tube starts to flatten. This will keep pressure on the aluminum-to-aluminum joint.

The aluminum element slides into the opposite end of the coil assembly. The hose clamp there can be tightened until the element just slides in snugly.

A 12-inch clip lead connects the aluminum element to the coil. Bolt the plain wire end to the $^3/_4$-inch tube three inches from its end. Many alligator clips will fit in the space between the turns of the coil (about $^3/_{16}$ inch), but I prefer using a solid-copper clip (Mueller TC-1). I cut off most of the jaws, so that only the part close to the hinge grabs the coil. This shorter lever grips very tightly.

Wire and Spool

The lower half of the antenna is insulated wire that is about $\lambda/4$ on the band of operation. The wire is pulled from the spool, and the remaining wire forms an inductance that doesn't add much to the antenna length. The Home Depot sells #12 and #14 insulated stranded copper wire in 50 and 100 foot lengths, on plastic spools. (See Figure 6.) A $^1/_2$-inch dowel fits into the spool to become a handle and spool axle. Bolts through the dowel on either side of the spool hold it in place. A crank handle is made by putting a one-inch-long bolt through the spool flange.

I calibrate the wire on the spool with markers and electrical-tape flags. There's a mark (from a permanent marking pen) at each foot, a black flag every five feet and a length-marked colored flag every 10 feet.

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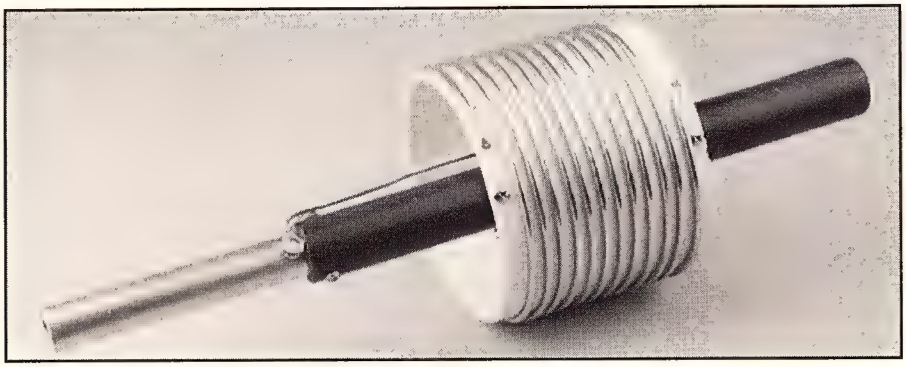
[1] The PVC pipe that is generally available, Schedule 40, is okay, but a stronger support can be made with $^3/_4$-inch Schedule 80 PVC pipe. It has the same outside diameter with a thicker wall. It can be made even stronger by forcing a $^3/_4$-inch wood dowel into it. You must drill or file the inside of the pipe to fit $^3/_4$-inch aluminum tubing into it. Schedule 80 PVC pipe is available from large plumbing distributors. Call before shopping. An even more rigid coil support can be made with a 1-inch OD, $^1/_8$-inch wall fiberglass tube, available from Max-Gain Systems, Inc, 221 Greencrest Ct, Marietta, GA 30068-3825; tel 770-973-6251.


(A)

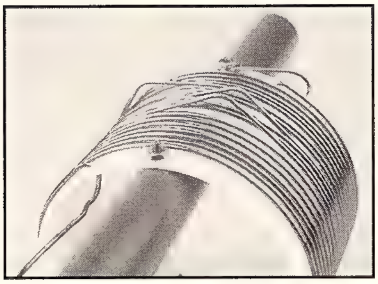

(B)

Figure 5—A shows the loading coil for the 20, 30, and 40-meter band coverage. The short aluminum tube on the coil slides into the flagpole bracket, and the tubing element slides into the other end of the PVC pipe. The wire and clip connect the element to the coil. B shows the coil for operating the antenna on 80 meters. This is placed in the flagpole bracket and the 40-meter aluminum coil plus the tubing element is inserted into it.

Table 1

	Tubing Length (ft)	*Coil Turns*	*Wire Length (ft)*
6 meters	4	0	4
10 meters	7	0	8
	4	1.7	7
12 meters	8	0	8.3
	4	1.8	9
15 meters	10	0	10.3
	8	1.8	10
	4	3.5	10
17 meters	11	0	13
	8	2.2	13
	4	4.2	13
20 meters	11	1	16
	8	4	16
	4	6.2	16
30 meters	11	4	24
	8	7	24
	4	10.5	24
40 meters	11	9	32
	8	12	32

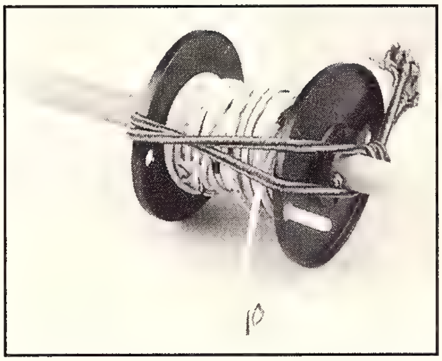


Figure 6—The wire spool has a wooden axle/handle and small handle for winding the wire. A bungee cord stretched over the spool and around the axle prevents the wire from unwinding.

Simply mark the length for each band, if you like.

We must prevent the wire unspooling, especially when it's hanging from a window mounting. A heavy rubber band works, but it doesn't last long. A better solution is a loop of light bungee cord, preferably with a knot for grip. The bungee loop runs from the axle/handle around the spool making a half twist on the way, and then passes over the axle end on the other side of the spool. (See Figure 6.)

Operation

Table 1 lists element length, wire length and coil tap point for various bands. When the "turns" is zero, the coil is not needed. On all bands except 6 meters, you can simply bypass the coil with the clip lead, the extra length just lowers the frequency a bit. For 6 meters, the coil *must* be removed. The location of the unspooled wire greatly affects the settings, so these numbers are only starting points. The lengths in the table were taken with the wire one to three feet above ground, draped over and through bushes and flowerbeds. The antenna will still work if the wire is lying on the ground, but it will require less unspooled wire to resonate. An SWR analyzer is very helpful while adjusting this antenna. I have not used a balun with this antenna (except for some testing), and I don't think one is necessary.

The SWR is less than 1.5:1 on all bands, and it's usually below 1.2. Occasionally, a band shows a higher SWR (still less than 2:1), but I have always been able to lower it by adjusting the length or location of the lower wire. I have not used the antenna from a high window where the wire hangs straight down, so cannot say what the SWR will be in this case. Never set up the antenna where it could fall and injure someone, or where the unwary could get an RF burn by touching it.

My results with this antenna have been excellent, both from home and on vacation. If you haven't yet operated from a seashore location, be prepared for a pleasant surprise! The good ground afforded by the salt water really makes a difference. In addition, I believe that coil radiation contributes to the success of the antenna.

80 Meters

It's easy to add this lower frequency band. Figure 5B shows a 35 µH coil for 80 meters. It's constructed and tightened just like the 40-meter coil, but has 20 turns of #12 magnet wire.

To operate on 75/80 meters, insert the new coil into the flagpole bracket and plug the 40-meter coil into it. Tune across the band with the movable tap on the 40-meter coil. This varies antenna resonance from below 3.5 to above 4.0 MHz, with the full 11 feet of tubing extended. If your version doesn't achieve this tuning range, adjust the spacing of the turns on the 80-meter coil.

The 80-meter coil has a five-inch length of 3/4-inch aluminum tube inserted into one end of the 1/2-inch PVC pipe that supports the coil form. One end of the coil is connected to this aluminum tube. The other end is secured under the bolt that holds the coil form to the PVC pipe. A second clip lead connects the base of the 40-meter coil to the outer end of the larger coil. The length of wire on the spool must also be increased to about 64 feet.

2 Meters

A $\lambda/2$ dipole for 2 meters can be made with about 15 inches of 1/2-inch aluminum tubing in the flagpole bracket, and 18 inches of wire. The tubing element is shorter than normal for 2 meters because the bracket is also part of the antenna. You can also shorten the 6-meter wire a bit and operate the 6-meter antenna as a $3\lambda/2$ on 2 meters, with a somewhat higher SWR.

Continuous Coverage

With easily changed element lengths and a continuously variable loading coil, the antenna may be operated on any frequency from 6.5 to 60 MHz, if coverage for other services is needed. With taps in the 80-meter coil at 8, 11 and 14 turns, the antenna will also tune from 4 to 7 MHz.

Bob Johns is a semiretired physics teacher. First licensed in 1952, he builds and experiments with coils, traps and antennas. He can be reached at Box 662, Bryn Athyn, PA 19009.

By George Pataki, WB2AQC

The Radio Amateurs of FYR Macedonia

Ham radio is alive and well in the mysterious Balkans. And, as the author discovered, the hospitality of local amateurs is matched by their enthusiasm for radio.

My trip to FYR Macedonia (Former Yugoslav Republic of Macedonia) was sparked by a contact with Venco, Z31JA, who urged me to visit his country as part of an upcoming trip to my native land of Romania. With only a short time to prepare, I secured a visa from the Macedonian consulate in Manhattan, read several books about the country and poured through internet sites for the rest. I also wrote a letter to the Radioamateur Society of Macedonia (RSM) in the capital city of Skopje, alerting members of my visit.

After an eight-hour flight from New York City to my native town of Timisoara, Romania, I spent a couple of days acclimating before I went to the Yugoslav consulate to get a transit visa. At first, the consul advised me not to travel to Yugoslavia, warning me about potential political disturbances. But after more discussion—and after advising me not to take any weapons!—he relented.

I took one train to Belgrade and another to Skopje. At the border, neither Yugoslav nor Macedonian customs officials were interested in my luggage. But a Macedonian border guard looked at my passport, took it, and motioned for me to get off the train, follow her, and leave my luggage behind.

This was starting to feel like the plot of a spy novel! After all, it was the middle of the night, and I was being detained at a foreign train station. The official took me down to the guard house and handed my passport to another officer, who applied a visa. I pointed out that I already had a visa from their consulate in New York, and we each mumbled a few phrases in our respective languages. I returned to the train, where I thankfully found my luggage intact.

Around midnight, after nearly 10 hours on the train, I arrived in Skopje, where Venco, Z31JA; Chris, Z31GX; and Dimko, Z32DR; were waiting for me. After a two-hour trip by car we arrived at Stip, 60 miles southeast of the capital city.

Stip

In Stip, I slept at Venco's house. Venco is a civilian employee of the army who works in communications. He was licensed in 1983, is an avid contester, DXer and an occasional builder. To complement his transceiver and Heathkit 1-kW amplifier, Venco has a two-element quad for 10, 15 and 20 meters, and several wire antennas. He is a reliable QSLer. His wife Lily, Z36ARA, was licensed in 1992. According to her license class, she operates only on VHF and UHF.

In the morning we went to the local radio club station, Z32GBC (ex YU5GBC, 4N5GBC and 4N5M). The club has many operators, with and without personal call signs. Chris, Z31GX, is employed full time as the chief of the club.

The hams I met in Stip included Kiko, Z32RY, a maintenance technician in a shoe factory who was licensed in 1991 and operates mostly on CW; Marian, Z32PM, who is from Kicevo where he is in charge of the Technical Center; Zoki, Z31GB, a broadcast technician with more than 300 DXCC countries confirmed; Dragan, Z32XX, a broadcast technician who was licensed in 1992; Momo, Z31MM, an architect, licensed in 1964, who is the vice president of the radio club; and Toni, Z32ZT, an electrician at the telecommunications office.

Day two started with a "fox hunt," or direction-finding contest. It was held in a wooded area near Stip, where 23 participants aged 12 to 69 battled to find five 80-meter "hidden foxes" in five competition categories. Each fox was guarded by a soldier, who stamped participants' tickets to mark each

Venco, Z31JA, a communication technician, relaxes in his station in Stip.

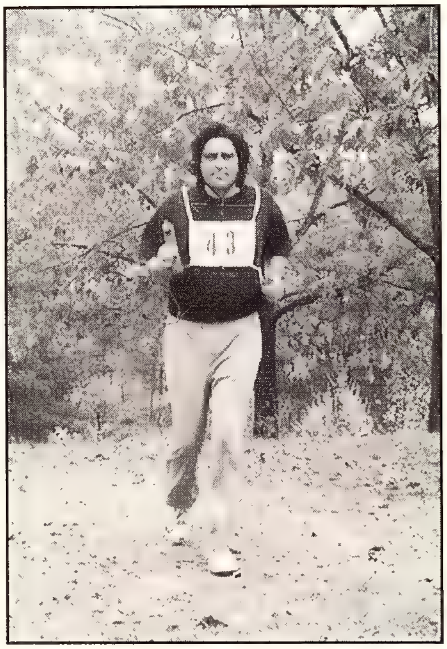
Chris, Z31GX, chief operator of the radio club in Stip.

Table 1

Macedonian Amateur Radio call sign prefixes and license categories.

Z30	Special call signs
Z31	A class: all bands, all modes, 1.5 kW
Z32	B class: all bands except 30 and 160 meters, 300 W
Z33	C class: 40 and 80 meters only, all modes; 21.1-21.15 MHz CW, 300 W
Z34	D class: VHF and UHF only, all modes, 150 W
Z35	Repeaters, digipeaters, beacons, etc
Z36	E class: VHF and UHF only, FM only, 30 W
Z37	Radio clubs
Z38	Special call signs for foreigners
Z39	Special call signs

The Stip fox hunt is about to begin. Judge Chris, Z31GX (left), and participants gather at the starting line.



Toni, Z32ZT, closes in on the fox! He won first place in the "senior" category.

discovery as official.

About one and a half hours after the start, Djordje, Z32LD, from the old-timer group, arrived first. Second to cross the line was Toni, Z32ZT, who took the first place in his senior category.

In Stip I gave two news interviews; one for radio, another for television. It must have been a slow news day for the journalists to interview me, a tired old man who couldn't speak Macedonian and could talk about nothing other than Amateur Radio! I spoke English for the TV interview, but when we later watched the broadcast I was amazed to see myself speaking perfect Macedonian!

Kocani

The next day I took a train to Kocani, about 25 miles to the northeast. At the railway station, Zoki, Z31VP, and Jane, Z31CN, were waiting for me. They took me to their radio club, which is named after renowned inventor Nikola Tesla (as are many club stations in the region). Zoki is the chief operator of club station Z37DRS (ex YU5DRS, 4N5DRS and 4N5C).

The club has a TS-820S running 100 W to a two-element quad for 10, 15 and 20 meters, delta loops for 40 and 80 meters, a two-element fixed wire Yagi for 80 meters and various antennas for 2 meters.

The club has many operators, including Jane, Z31CN; Baco, Z31HB; Cucy, Z32CC; Todd, Z31ET; Edita, Z34XYL; Mike, Z32FK; Vane, Z31VJ; Zoki, Z31VP; and others.

Zoki, Z31VP, is a civilian employee of the army, working in communications. He has a modern Japanese transceiver, and on the top of his apartment building he has a three- element Yagi for 10, 15 and 20 meters. He uses a computer and was licensed in 1971. Zoki is a contester and a DXer with more than 200 DXCC countries confirmed. His QSL manager is Aco, DJ0LZ (ex YU5FD).

Cucy, Z32CC, licensed in 1991, is an electronics technician. He enjoys working on and adding to his home-made station.

Mike, Z32FK (ex YU5FK and 4N5FK), licensed in 1988, is an economist. He is a member of the Macedonian DX Group and the Macedonia Telegraph Group. Mike is a builder, contester and a DXer with more than 300 DXCC countries confirmed.

Baco, Z31HB, licensed in 1974, is a retired factory worker. He is an avid builder and has worked more than 100 DXCC countries. His children, ages 16 and 18, are club operators who are studying for their license tests.

Todd, Z31ET, licensed in 1983, is a traffic policeman. He has eight different types of colorful QSL cards, some with his wife Edita, Z34XYL. Todd has 311 DXCC countries confirmed and is an enthusiastic fisherman.

I spent the night as the guest of Jane, Z31CN. Licensed in 1976, Jane is a tax inspector and an occasional writer of poems, short stories and articles. He was formerly YU5CN and 4N5CN, and is a member in the Macedonia DX Group. Jane has a Yaesu FT-101E transceiver and prefers CW.

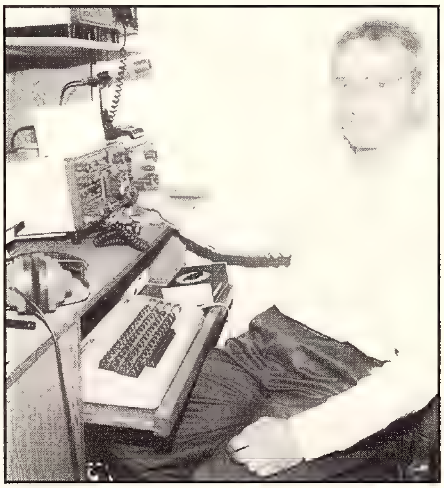
Blatec

Next on the itinerary was Blatec, a small village about 15 miles east of Kocani, where we traveled to see Stole, Z32KS (ex YU5XKS). A master builder who was licensed in 1970, Stole has a radio-TV-electronics repair shop. He was quite active years ago, building and using the first SSTV station in FYR Macedonia. Stole has a series of home-made equipment, including an 800-W amplifier, and works CW, SSB, RTTY, color SSTV and packet radio. An occasional contester, he's worked about 100 DXCC countries on SSTV. From Blatec I returned to Stip to pick up Venco and Chris, and together we went to Veles, formerly Tito Veles, about 25 miles west of Stip.

Veles

In Veles we found Vane, Z31VV, a retired army officer, at the local facility for retirees. He took us to his house to show us his station, a Yaesu FT-501 and a FL-2000B linear amplifier (which he seldom uses because of TVI). Vane was licensed in 1953; has a home-made vertical antenna and operates only on 20 meters, mostly on CW.

In Veles we also visited Pepi, Z31PK, with whom I had several QSOs when he held call signs YU5PK and 4N5PK. Pepi, licensed in 1964, is a communications technician working at City Hall. Pepi is a builder and his specialty is linear amplifiers. He's also a contester and a successful DXer, with 320 DXCC countries confirmed. His manager is Aco, DJ0LZ (ex YU5FD), who works with many other Macedonian amateurs.



Fingers on the paddles, ready to go. Zoki, Z31VP, is a communication technician in Kocani.

Kavadarci

From Veles, again with Venco and Chris, I went south about 26 miles to Kavadarci. There we visited radio club Z37KXY (ex YU5KXY and 4N5KXY), located in the Technical Center. These centers are common here, and some host radio clubs, photo clubs, and other activities. At the club we met Mladen, Z32MB, employed there as chief operator. The club has a Yaesu FT-101 transceiver, a computer, a two-element quad for 10, 15 and 20 meters, a three-element Yagi for 15 meters, a delta loop for 40 meters, a wire dipole for 80 meters, and several 2-meter antennas.

At the club station we also met Dean, Z32MV, licensed in 1966. Dean graduated from a trade school for electricians and is an active DXer. We also met two club operators, both active on CW and SSB. In Macedonia, hams have to be at least 18 years old to hold HF tickets, and 16 years old to claim UHF privileges. Didi, a young lady of 16, is a high school student who started her Amateur Radio career at age 11. She has several wins in the high-speed telegraphy championships. Nick, another club operator, is a 14-year-old high school student with at least one high-speed Morse code championship under his belt.

Gevgelija

We traveled 45 miles southeast from Kavadarci to Gevgelija, right on the border with Greece. Here we visited club station Z37FAD (ex YU5FAD, 4N5FAD, YT5G, YT5FAD and Z350FAD). The club has four rooms: the radio room, a QSL bureau, a shop/laboratory, and a storage room. The station uses factory-made transceivers and a huge home-made amplifier with three wire dipoles for 20, 40 and 80 meters (the other bands are used with an antenna tuner).

Ven, Z32AF, licensed in 1985, is president of the club. He is a broadcast technician at a local FM station. Ven has worked more than 300 DXCC countries. I remember working Ven when he held call sign YZ5AA.

Joe, Z31DX, and Don, Z32AM, are a father-and-son team. Joe (ex 4N5DX), licensed in 1965, is a metal worker. He is a builder, a contester and a DXer with more than 300 DXCC countries confirmed. Among his many antennas is a two-element sloping wire Yagi, for 40 meters.

Don, Z32AM (ex YT5AA), licensed in 1983, lives in Dojran, about 20 miles from Gevgelija. He is a contester, a DXer and a good QSLer. I worked him on the air and received his card through the bureau. Don is also a mountain climber and has participated in several daring expeditions in Macedonia and elsewhere.

Struga

In Struga, near the Ohrid Lake in the southeastern corner of the country, lives Vlado, Z32KV (ex YU5KV and 4N5KV), who was licensed in 1987. He started his ham activity in 1983 at the local radio club, YU5FCA (now Z37FCA). He is the editor of *ARO*, the 20-page monthly bulletin of the Radioamateur Society of Macedonia. Vlado has worked 290 DXCC countries, has the 5BDXCC, 5BWAZ, WPX Honor Roll and many other awards. He has operated from ZA, LZ, YU and UA.

Strumica

We continued our journey 35 miles north of Gevgelija to the city of Strumica to see Pance, Z31RB (ex YU5XPX, YU5RB and 4N5RB), and his wife Mare, Z36XAM. Pance is an economist in an appliance factory. He is a member of the Macedonia DX Group and has more than 300 DXCC countries confirmed. Mare is a bank director and, according to her license category, works only FM on VHF and UHF. The two have a very nice station with modern Japanese transceivers and a six-element Yagi.

Tetovo

From Strumica we went northwest to the capital city of Skopje, then straight west about 23 miles to Tetovo. There we visited a big gun: Zika, Z31CZ (ex YU5CZ and 4N5CZ), licensed in 1970. Zika, an economist, is the director of an electrical factory. He is running 100 W from a TS-930S, sometimes with a home-made 1-kW amplifier. Zika has a two-element quad for the HF high bands, a three-element fixed wire beam for 40 meters, a dipole for 40 meters, a sloper for 80 meters, and several antennas for 2 meters. Zika has earned 5BDXCC and 5BWAZ, and scores of other prestigious awards.

The impressive station of Z31PK in Veles.

Joe, Z31DX, prefers a compact operating position. He is a sheet metal worker in Gevgelija.

Meto, Z31VL, is a retired railway worker in Skopje.

Skopje

From Tetovo, Venco, Chris and I turned east and went to the capital city of Skopje to pay a visit to the headquarters of the Radioamateur Society of Macedonia, where we met the secretary handling administrative chores. Surprisingly, there is no active radio club in Skopje, the country's capital and its largest city.

Here we visited Meto, Z31VL, a retired railway worker licensed in 1960. I had met Meto previously in Stip, where he had participated in the direction-finding contest, taking third place in the old-timer category. He is a member of FIRAC, the railway workers' radio amateur association. Meto likes to ragchew with friends. From the Bosnian Amateur Radio Association Meto received a special commendation for his "Extraordinary Contribution in Relaying Humanitarian Messages of the Citizens of Bosnia-Herzegovina, 1992-1995."

In Skopje we also saw Mile, Z31JY, a 72-year-old retired flight controller who was licensed in 1950. He is one of the earliest hams in Macedonia and works CW only.

Bob, Z32BU (ex YU5XBU and YU5BU), licensed in 1985, is a civilian employee of the army; he repairs communications equipment. Bob is the technical editor of *ARO*, the monthly bulletin of the Radio Amateur Society of Macedonia.

Loose Ends

I had a great time visiting the amateurs of FYR Macedonia. They are somewhat isolated in the Balkans and not many tourists travel there. The shortage of funds makes mailing QSL cards difficult. Necessity, being the true mother of invention, helps Z3 hams become skillful builders. The lack of technical books and magazines slows their progress. Old Amateur Radio publications can be sent to various club stations at their *Callbook* addresses. These publications will be thankfully received.

The next time you have a QSO with a Z3 amateur, for a moment, imagine yourself in his or her place, then ask yourself how you can help a fellow ham.

George can be reached at 84-47 Kendrick Pl, Jamaica Estates, NY 11432, or by e-mail **wb2aqc@aol.com**.

All photos by the author.

By David Greer, N4KZ

Thanks, Barry

Although former Senator Barry Goldwater, K7UGA, is widely known for his role as an American statesman, ham radio operators knew and respected him for his contributions to Amateur Radio—large and small.

When 89-year-old Barry Goldwater, a former US senator from Arizona, 1964 presidential candidate and long-time ham, died a couple of months ago, the news sent me to my ham shack. There in a paper bag I found a QSL card from Goldwater—a memento of the personal favor he did for me 28 years ago when I was a 16-year-old high school junior here in central Kentucky.

After-School QSO

The date on the QSL card was October 14, 1970. On that day, as I did every day after school, I turned on my Yaesu FTDX-400 transceiver and prowled the bands in search of DX. Most days I ended on up 15 meters working stations on SSB or CW. But on that particular day, for some reason I gravitated to 40-meter SSB. I found a clear frequency and called CQ. Goldwater, first licensed as 6BPI in 1921—when Arizona was part of the sixth call area—answered. Even though he was using his less-well-known secondary call sign of K3UIG from Washington, I recognized him right away. At home in Arizona he was K7UGA—a call sign known around the world. (Yes, back then the FCC issued separate call signs for secondary QTHs.)

One of my most treasured possessions—the QSL from K3UIG, Barry Goldwater's Washington, DC station, confirming our contact.

Celebrity status aside, it was a typical QSO. He called me David. In turn, I called him Barry. I was only 16, however, and calling a US Senator and former presidential nominee by his first name gave me chills!

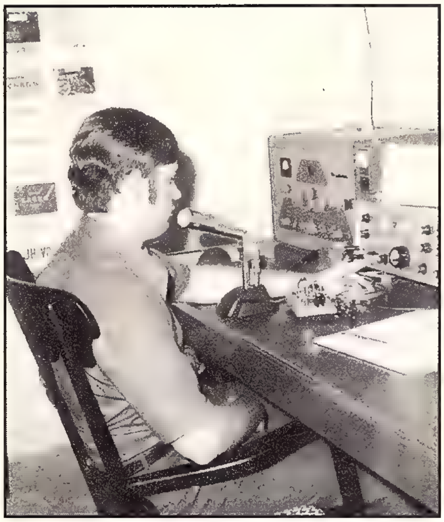
Barry was at his Washington, DC, condominium, he said. We exchanged typical ham small talk. He was running a Signal One transceiver and a Hustler trap vertical antenna on the roof. My rig ran 500 W PEP input (as we used to say in those days). My antenna was an inverted **V** 50 feet high at the apex. After 30 minutes of rag-chewing, Barry said he needed to shut down because he had dinner on the stove.

That's when my moment of indecision ended. All through the QSO I had wanted to ask Barry for his help with a problem I was having with the FCC.

"Barry, before you go, I need a favor," I said.

"Sure," he replied. "What do you need?"

I told Barry of the license exam I'd taken at the Federal Building in Louisville to upgrade from General to Advanced class. Long before the Internet, e-mail, friendly computer databases and instant upgrades, it typically took six to eight weeks to get a new ham ticket in the mail. In those days we had to wait until we had "paper in hand" before we could use our new privileges. It was always an agonizing wait. In my case it had been 13 weeks since I passed the Advanced exam, I told Barry, but I still hadn't received my new license in the mail.



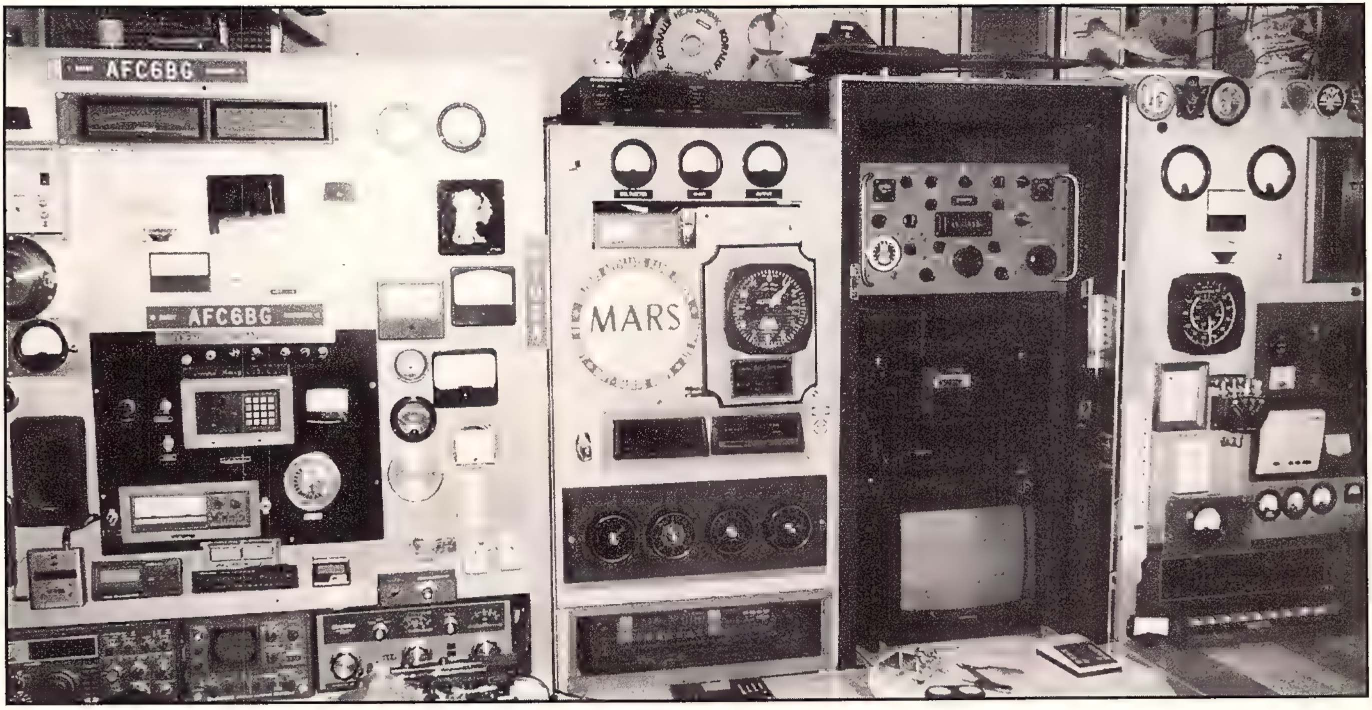
I was just 16 years old in 1970 when I worked Barry Goldwater. A few weeks later, the editor of the local newspaper snapped this photograph when she visited my shack for an interview about the QSO.

"No problem," Barry said. "I have lots of friends at the Commission. I'll have my secretary call over there tomorrow and get it straightened out."

My heart soared. I gave him all of the pertinent information, including my full name, date and location of where I'd taken and passed the exam, and so on. The next afternoon our phone rang. It was a man at the FCC in Washington. I don't remember his name, but I recognized him at the time as being a well-known FCC official.

"We got a call today from Senator

BRIAN D. WOOD, AA6FV



The main operating position of Barry's station at his Arizona home, circa 1996.

Goldwater's staff," he said. "I want to apologize to you because your application and several others were lost when we upgraded our computer system at our Gettysburg processing center. You'll get your new license in the mail in two days, and if you don't, call me back," the official said.

People had problems with computers 28 years ago. It's nothing new!

There was something truly satisfying about a federal bureaucrat calling a teen-ager in Kentucky and apologizing. Of course, Barry's clout made it possible.

The New Ticket

My new Advanced ticket came two days later, just as he said it would. As I pulled my upgraded license from the mailbox, I just had to get on 20-meter SSB. But there was a problem—a huge problem. I didn't have a 20-meter antenna!

Not one to accept defeat, I marched into our garage, where I found aluminum tubing from an old Gotham 15-meter beam. It had served me well in the 15-meter Novice subband, where I had worked some 50 countries in six months the year before. Unfortunately, the mast had collapsed in a windstorm, wrecking the beam. Like any good ham, I had saved the tubing for future projects.

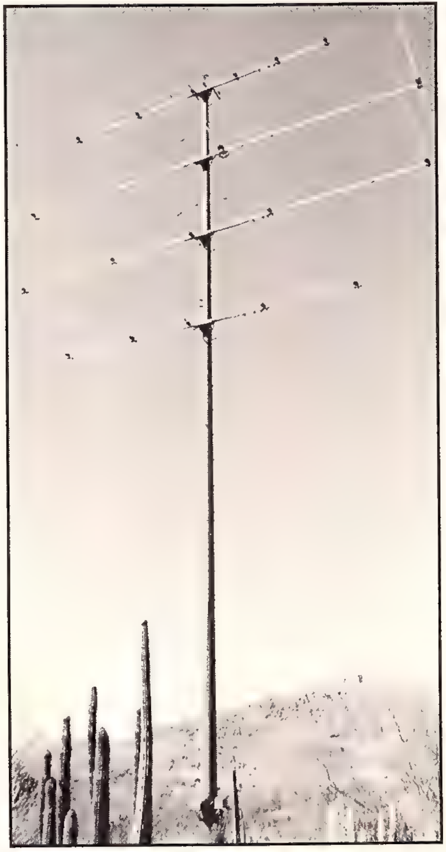
With help from a hacksaw and a tape measure I soon had a quarter-wave vertical for 20 meters. I found an old broomstick, broke it over my knee, put the tubing over one end of the broomstick and stuck the sharp end into the ground. I attached coax and trailed four quarter-wavelength radials atop the grass. I was ready for 20 meters in 20 minutes flat.

I tested the SWR—it was 1.5 to 1. I was ready for 20. I tuned the Advanced segment of the phone band and quickly found a large pile-up. I listened a moment. It was a VK6 from Perth coming in long path. He stood by. I shouted, "WB4MEN. Whiskey Bravo Four Mike Echo November, in Kentucky, calling."

He came right back to me!

Thanks, Barry.

BRIAN D. WOOD, AA6FV



K7UGA's tower stands tall above the Arizona desert.

Epilogue

Six weeks after our QSO, Barry sent a QSL card. It featured his K3UIG call sign in big letters, a photo of the Capitol, a photo of the Arizona desert, and a reference to his primary K7UGA call sign at home in Arizona where he had a very elaborate station. For years, I proudly displayed the card on my shack wall, but the last move eight years ago saw the card shuffled off to a paper bag with hundreds of others. There it stayed until Barry became a Silent Key. It bears a 5-cent stamp and a scribbled message that says "David, sorry for the delayed card. Have been busy. 73, Barry."

A couple weeks after I worked Barry, I mentioned the contact to my mother. Always one who enjoyed celebrities, Mom immediately called the editor of the local newspaper—coincidentally the same paper where today I serve as publisher. The then-editor came to my home that night to take my picture and interview me for a story. In the story, the editor mentioned two other local hams, Larry Walker, K4KZA, and Tom Lutes, K4ZBC. Walker, my ninth-grade English teacher and Elmer, had worked Barry's Arizona station on several occasions and had his own K7UGA card. After the story ran in the paper, other students teased me without mercy for months. I didn't mind one bit.

Now, 28 years later, I still work Larry and Tom every Sunday morning on 75-meter SSB. I don't know where all the time has gone, but ham radio is just as much fun today as it was back in October of 1970.

You can contact the author at 121 Abbey Ridge Dr, Bardstown, KY 40004 e-mail **greer@bardstown.com**

NEW HAM COMPANION

The Doctor is IN

Q A friend of mine was attempting to load his 40-meter dipole antenna on 160 meters and his antenna tuner started arcing. Fortunately, there wasn't permanent damage, but it sparked (no pun intended!) a discussion about the nature of arcing itself. What exactly is going on when arcing takes place?

A The simple answer is that arcing is a manifestation of *dielectric breakdown*, but you know the Doctor can't stop there!

All insulating materials, including the air itself, are dielectrics. In an ideal world we could take any two conductors and put as large a voltage as we wanted on them, no matter how close together they are. The dielectric material between them would prevent any catastrophe. In the real world, however, dielectrics have very specific limits on how much voltage (applied to a given area) they will tolerate.

The electrons in the atoms of the dielectric material feel an attractive force when placed in an electric field. If the field is sufficiently strong, the force will strip away electrons. These free electrons are now available to conduct current and they are moving at extremely high velocities. The free electrons slam into other atoms, freeing even more electrons. In a short time there are enough free electrons to produce a large current flow. When this happens, we say the dielectric has suffered "breakdown." When the dielectric is air, you see the result as a bright spark or "arc."

Table 1
Dielectric Constants and Breakdown Voltages

Material	*Dielectric Constant**	*Puncture Voltage***
Aisimag 196	5.7	240
Bakelite	4.4-5.4	240
Bakelite, mica filled	4.7	325-375
Cellulose acetate	3.3-3.9	250-600
Fiber	5-7.5	150-180
Formica	4.6-4.9	450
Glass, window	7.6-8	200-250
Glass, Pyrex	4.8	335
Mica, ruby	5.4	3800-5600
Mycalex	7.4	250
Paper, Royalgrey	3.0	200
Plexiglas	2.8	990
Polyethylene	2.3	1200
Polystyrene	2.6	500-700
Porcelain	5.1-5.9	40-100
Quartz, fused	3.8	1000
Steatite, low loss	5.8	150-315
Teflon	2.1	1000-2000

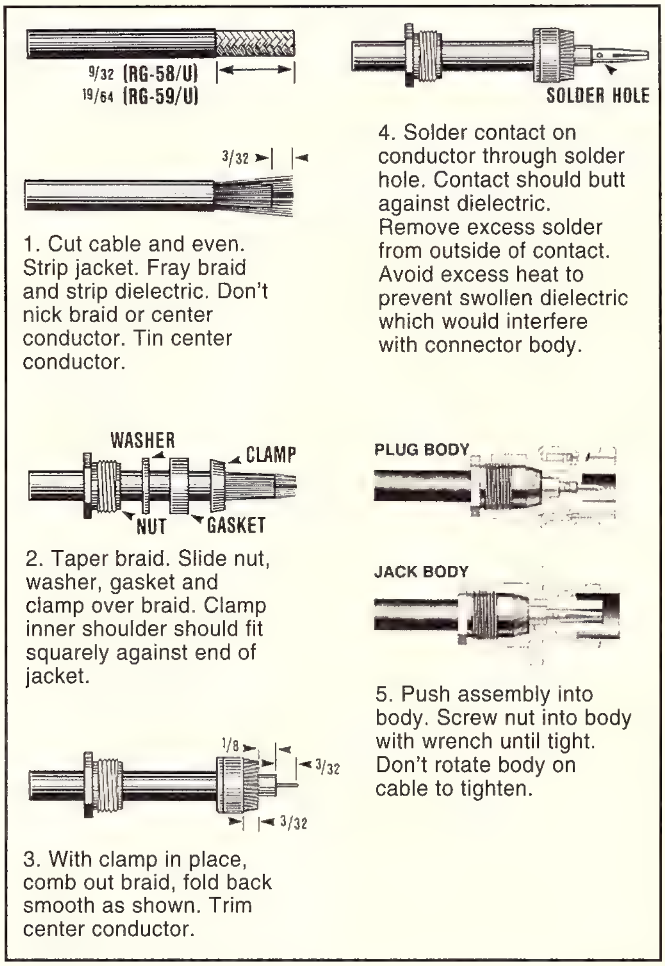
* At 1 MHz
** In volts per mil (0.001 inch)

If the dielectric is a liquid or gas, it can "heal" when the voltage is removed. A solid dielectric, however, cannot repair itself. Solid state devices are ruined, holes are burned through insulated wires and so on. Arcing is most often seen in RF circuits where the voltages are high (such as in your friend's antenna tuner), but arcing is possible anywhere two components at significantly different voltage levels are closely spaced.

The breakdown voltage of a dielectric depends on its composition and thickness (see Table 1). The variation with thickness is not linear. In other words, doubling the thickness does not quite double the breakdown voltage.

Q Steve Williams, N9NIJ, asks, "Could you print the instructions on how to install a male BNC connector on RG-58 coax?"

A Gladly!
See Figure 1.



1. Cut cable and even. Strip jacket. Fray braid and strip dielectric. Don't nick braid or center conductor. Tin center conductor.

2. Taper braid. Slide nut, washer, gasket and clamp over braid. Clamp inner shoulder should fit squarely against end of jacket.

3. With clamp in place, comb out braid, fold back smooth as shown. Trim center conductor.

4. Solder contact on conductor through solder hole. Contact should butt against dielectric. Remove excess solder from outside of contact. Avoid excess heat to prevent swollen dielectric which would interfere with connector body.

5. Push assembly into body. Screw nut into body with wrench until tight. Don't rotate body on cable to tighten.

Figure 1—Installing a BNC connector in five steps.

Q What does the "limiter" limit in an FM receiver?

A The limiter stage of an FM receiver has the task of chopping most of the noise and amplitude modulation from an incoming signal. In most FM receivers the limiter immediately precedes the detector stage, known as the *discriminator* (see Figure 2).

Although discriminators are designed to respond to variations in frequency (which is how an FM signal is modulated—by varying the frequency), they will also respond to changes in signal voltage, or *amplitude*. Noise shows up on signals as variations in amplitude. So, to avoid detection of the noise component, you have to reduce or eliminate any variations in amplitude.

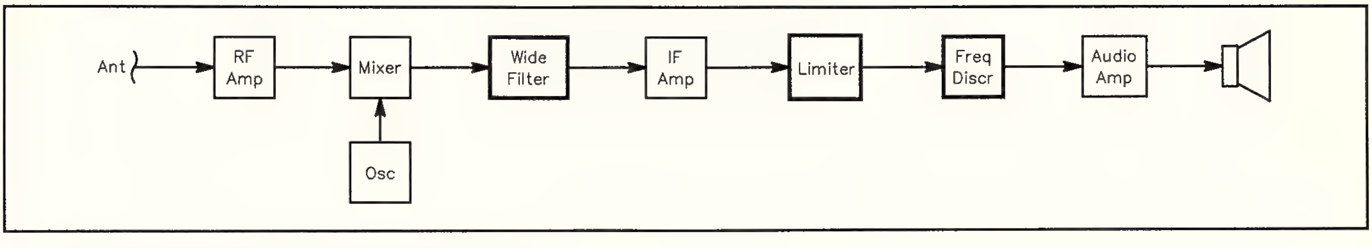
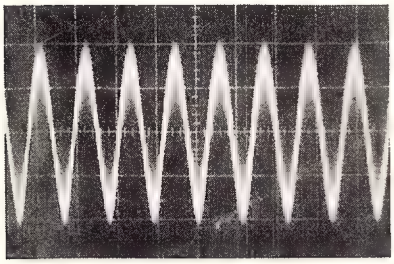


Figure 2—A block diagram of a typical FM receiver.

Limiter circuits are basically amplifiers, but with an interesting catch. When the input signal increases beyond a predetermined point, the limiter overloads and stops amplifying. In this way the limiter limits variations in amplitude. Take a look at the "before and after" photographs in Figure 3.

When sufficient signal arrives at the receiver to start the limiting action, the radio *quiets*—that is, the background noise disappears. When you hear someone on the air say, "I'm receiving the repeater full quieting," they mean the signal is so strong that the limiting action is removing every trace of noise. By the way, the sensitivity of an FM receiver is rated in terms of the amount of signal required to produce a given amount of quieting, usually about 20 dB.



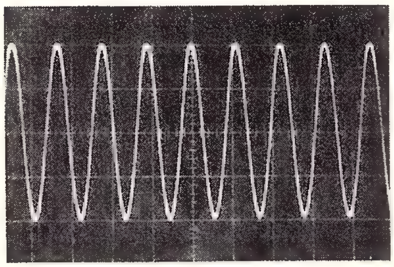


Figure 3—At (A) the input waveform to the limiter stage shows amplitude modulation (AM) and noise. At (B) the same signal after passing through two limiter stages. Notice that the AM components are gone.

Q Jeff St Pierre, N1HCL, asks, "A plastic statue of Reddy Kilowatt, made in 1940, has decorated my ham shack for several years as a kind of electrical safety reminder. Recently I was told that I might be the owner of a valuable collectible. Is this true?"

A Many hams have electrical/electronic collectibles in their shacks—including transmitters and receivers—and some are beginning to take their value seriously. This subset of the ham hobby has been gathering strength in recent years.

Reddy Kilowatt is actually a trademark of Reddy Corporation International. Reddy was created in 1925 by Ashton Collins, general commercial manager of Alabama Power Company as a symbol to explain the value of electric service and its potential. While watching a thunderstorm one night, Collins saw two lightning bolts converge to form the arms and legs of a person. Sketching the bolts on paper, Collins added hands and feet in rubber gloves and shoes for safety, drew a round smiling face with light-bulb nose, and used electric outlets for ears.

Over the years, Reddy's appearance has been reworked and refined. By the 1940s Reddy was appearing on everything from table napkins to clocks. In 1947 cartoonist Walter Lantz, creator of Woody Woodpecker, developed the first animated film starring Reddy.

Assuming your Reddy statue is in good condition, it may indeed be a valuable collectible. (At one Web site devoted to collectibles, a Reddy Kilowatt ashtray was selling for $30.) You might start asking around at local antique and collectible dealers, and on the Internet.

Q Can you explain knife-edge diffraction? I was told that you could use this technique to communicate on VHF or UHF with stations blocked by mountains or hills. Is this true?

A What you have heard is indeed true—at least under certain conditions. When a radio wavefront passes over the sharp edge of a mountain or hilltop, the portion of the wave adjacent to the edge is slowed down slightly. This makes the wavefront appear to bend around the obstacle (Figure 4). The net effect is to allow some RF energy to appear behind an otherwise solid object!

The crest of a range of hills or mountains at least 100 wavelengths long at the operating frequency can serve as reasonable knife-edge diffracters. (This would be about 683 feet at 144 MHz.) Crests that are sharp, clear of trees and horizontal make the best edges, but even rounded hills may work.

Knife-edge diffraction works in both directions. Although only a small amount of energy is diffracted, it may be possible to communicate over paths of 60 miles or more.

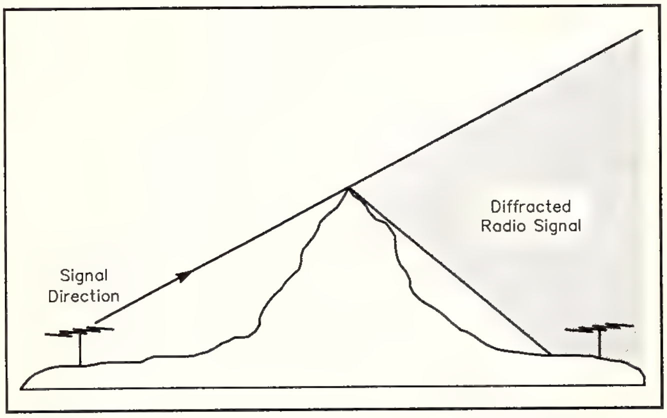
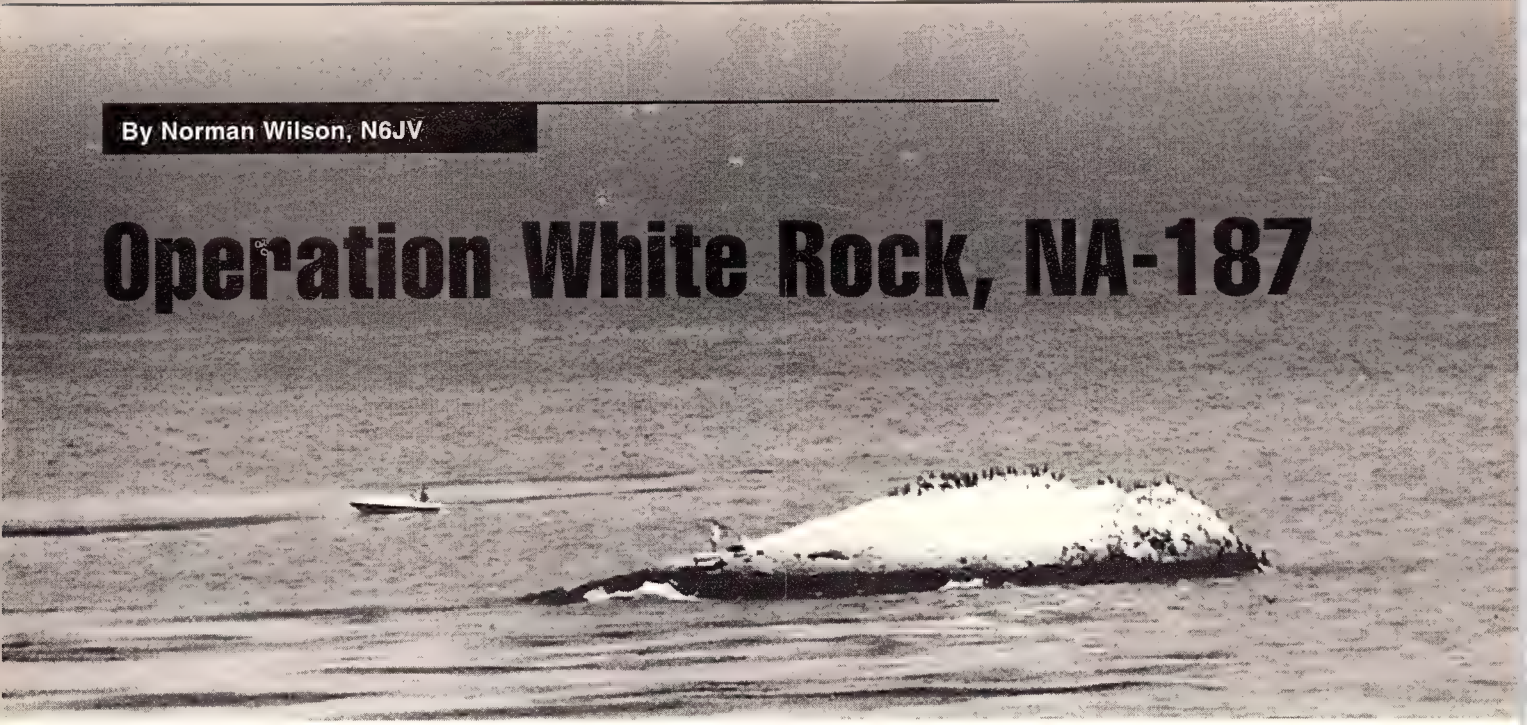


Figure 4—VHF and UHF knife-edge diffraction allows contacts to be made behind hills and mountains.

Do you have a question or a problem? Ask the doctor! Send your questions (no telephone calls, please) to: "The Doctor," ARRL, 225 Main St, Newington, CT 06111. QST

By Norman Wilson, N6JV

Operation White Rock, NA-187



White Rock—NA-187 according to the Islands on the Air program. It's home only to birds, flies and assorted crustaceans.

If you think landing a rubber raft on a rocky beach in rough seas is a job reserved exclusively for Navy Seals, you've obviously never been obsessed about putting an island on the air. Make that "Islands on the Air," as in IOTA, the international island-only DX awards program. Here's one home-grown DXpedition that took on a life of its own!

California's White Rock is located between the Port of San Luis and the City of Pismo Beach. There are a few rocks and only a few real islands along the California coast. In fact, only Lobos and Ventura Rocks, which are south of Monterey, have ever been designated the Islands on the Air (IOTA) program. When I became interested in the IOTA program (see the sidebar, "IOTA: The Basics"), I remembered a rock near Pismo that I had first seen back in 1949. My family had been vacationing in the area for many years. The solo boulder, known simply as White Rock, was quite a ways out to sea and always had a flock of sea birds on it. Could I possibly stage my own IOTA operation from this forelorn outcrop?

I knew it wasn't going to be easy. Past problems with wildlife agencies had forced IOTA officials to require written documentation for any operation along the Pacific coast. It took me several months just to find a sufficiently detailed map that included White Rock. The fun was just beginning!

The Paper Chase

How could I get permission to operate from a rock that no one claims? The boulder belongs to the State of California, but government officials didn't seem to know anything about it. It was easy to find authorities who could tell me it was okay to land on White Rock, but no one was willing to put that permission in writing. And why should they? Civil servants don't get into trouble by saying "no," and few bureaucrats will put things in writing if they're not required to do so.

Then there were questions and ill-mannered assumptions about Amateur Radio itself. Would the RF sterilize the birds? After visiting more agencies than I can remember, the consensus was that an Amateur Radio operation from a remote rock should be no problem, but no one could think of who could, or would, give written permission.

White Rock missed the city limits of Pismo Beach by about a hundred yards, so the City Engineer suggested that the only local authority who could give permission was the local game warden, who was also a member of the Board of Directors of the Port of San Luis. Payday! The warden said, "Go for it." He'd seen no seals on the rock and the birds wouldn't be inconvenienced. He was also very understanding about my paper-chase problems.

The Boat

The game warden introduced me to the guy who ran the port's water taxi. He was willing to tow me out near the rock, but insurance problems wouldn't allow him—or anyone else he knew—to lend me a boat. Now, I'm not a boat person. I get seasick watching *Victory at Sea* reruns. An inflatable boat seemed to be the logical choice. They're difficult to sink and would probably be easier to handle in the rocks. I finally gave up on a rental and purchased a 10-foot *Zodiac* and a small outboard motor.

With the *Zodiac* in tow, my wife Mary and I made another trip to Pismo to do some scouting. I decided that I would be crazy to make the trip alone. The sea was rough and the fog was dense, so

My sons and I carried our *Zodiac* down to the water to begin our adventure.

IOTA: The Basics

Islands on the Air was created in the mid-1960s by British SWLer Geoff Watts. By the time the awards program was taken over by the Radio Society of Great Britain (RSGB) in 1985, it had already become popular the world over.

IOTA consists of 18 separate awards that can be claimed by any licensed ham operator eligible under the General Rules. Participants must be able to produce evidence of having made two-way QSOs, since November 15, 1945, with the required number of Amateur Radio stations located on designated islands worldwide. Many of the islands are DXCC countries in their own right. Others meet particular eligibility criteria and also count for credit. IOTA is an evolving program with new islands being activated all the time. Presently, the number of eligible islands totals nearly 1200!

The basic award is for working stations on 100 islands/groups. There are higher achievement awards for working 200, 300, 400, 500, 600 and 700 islands/groups. In addition, there are seven continental awards (including Antarctica) and three regional awards: Arctic Islands; British Isles; and West Indies. The IOTA Worldwide diploma is available for working 50% of the numbered groups in each of the seven continents. A Plaque of Excellence is available for confirmed contacts with at least 750 islands/groups. Shields are available for every 25 additional islands/groups. For proper credit, QSL cards must be submitted to official IOTA checkpoints for validation.

For more information on IOTA and how you can participate, write to the RSGB at IOTA Programme, PO Box 9, Potters Bar, Herts, England EN6 3RH, or point your Web browser to **http://www.rsgb.org/operate/iota/iota.htm**. Another handy Web site can be found at **http://www.islandchaser.com/**, the home of Islands on the Web, an interactive site for IOTA information. There you'll find IOTA DXpedition operating schedules, databases, "most-wanted islands" lists and a comprehensive list of IOTA links.

One of the best sources of IOTA information is the *RSGB IOTA Directory and Yearbook.* This is the official source of the program rules and so much more. The *RSGB IOTA Directory and Yearbook* is available from your local ARRL dealer or directly from ARRL. Mail orders to Publication Sales Dept, ARRL, 225 Main St, Newington, CT 06111-1494. You can call toll-free at tel 888-277-5289; fax your order to 860-594-0303; or send e-mail to **pubsales@arrl.org**. Check out the full ARRL publications line on the World Wide Web at **http://www.arrl.org/catalog**.

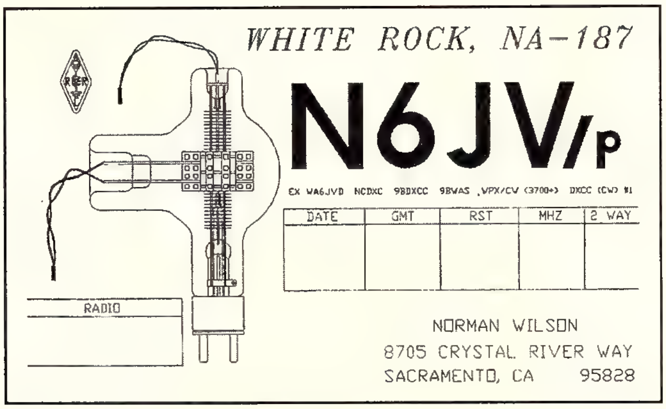
the annual family gathering in Pismo on the fourth of July was set as the target. My 23-year-old son Brian, on break from college, would sign on as a crewmember. My 17-year-old son Clint, coming home from Utah, would also help. I now had an organization.

The extra help, while welcome, led to tactical problems. It soon became obvious that I could take either the crew or the boat on the 300-plus mile trip to Pismo. Mary's car could haul only about half of the required payload. My old truck was near death, so I used the trip as an excuse to buy a new one. Now the organization was a convoy! Don, W6ED, a local island chaser, agreed to monitor 2 meters for safety reasons.

Norm's Navy

The week before the big event, the boys and I made a trial run to an island in a local lake. We took on a lot of water but proved that the *Zodiac* wouldn't sink. It was time to go for broke. The convoy made it to Pismo on the morning of July 4. A quick check of water and fog conditions convinced me that we might never get

I kept my back to the sun, birds and swarming flies as I worked the pileups from White Rock.



WHITE ROCK, NA-187

N6JV/P

EX WA6JVD NCDXC 9BDXCC 9BWAS ,VPX/CW (3700+) DXCC (CW) #1

DATE	GMT	RST	MHZ	2 WAY

NORMAN WILSON
8705 CRYSTAL RIVER WAY
SACRAMENTO, CA 95828

My special White Rock QSL card.

a better chance. Because the July 4 holiday is the harbor's busiest day of the year, we had to inflate the *Zodiac* in the parking lot and carry it to the water. Several trips later, our gear, the motor, and a gas tank were prepped and loaded. At about 2 PM, Brian and I made a dash for open water. We were already tired.

So far, so good. We were making progress and were well out into the bay. It's about three miles to White Rock. Observing our flotilla while floating on beds of kelp were several groups of otters and sea lions. After about 45 minutes, we neared the rock.

At first glance my son thought I was out of my mind. I almost agreed with him. This project had developed a life of its own and I was determined to see it through. In my mind I had imagined some place we could tie up and unload the gear. Fat chance! The landscape was nothing but jagged rock encrusted with barnacles, mollusks and starfish. Slippery seaweed covered everything and the waves were worse that I had imagined.

A good-size breaker tossed the boat into the rocks. With a rope in hand, Brian jumped onto a small rock that was separated from the main mass by a narrow, wave-swept channel. I couldn't tell him what to do next, so I jumped onto the same rock with a second mooring line. Now we were really in trouble. We were taking a beating and the boat had no place to go!

I jumped into the channel and waded over to the main rock. Brian soon followed, getting equally wet. The boat was getting cut up on the rocks, so we grabbed all of the equipment, including the motor and gas tank, unloading the gear in knee-high waves. When everything was ashore we picked up the boat and lifted it out of the surf.

Marooned on "Fly Rock"

White Rock has been given a bad rap mostly because of its name. White Rock is made of white rock. Most of the rocks and outcrops in the area are white shale. Bird deposits don't add much to the color. We were prepared for smelly operating conditions and were pleasantly surprised when things weren't all that bad. We soon found a worse curse—flies. They covered everything and everyone. We stayed near the edge of the rock, away from the roosting area, and the birds ignored us.

After removing the gear from its protective ammo cans, we prepared to operate. Brian set up the 15-foot whip antenna with roll-up radials and I unpacked the TS-180S transceiver and got the battery connected. When I put the headset on, the VOX tripped on 14.260 MHz and the familiar voice of Elizabeth, VE7YL, asked, "Is that you, Norm?" We were underway!

By now I was covered with flies. Brian tried to help by shooing them away with a life vest. After about 40 minutes, a harbor patrol boat pulled up near the rock to ask if everything was okay. Someone had noticed a guy on a rock waiving a red flag and had called for assistance! After some fast talking, the patrol boat pulled away.

To meet IOTA requirements, photos of our operation were in order. That's a tall order while operating from the rock, so documentary operations fell to Clint, the family photographer, who took his telephoto lens to get some shots from an outcropping called Fossil Point. Mary drove him to the Point and he climbed the rocks to reach the best vantage point. After a while, Mary got bored and decided to visit a nearby beach. As she waded into the water she was approached by some gentlemen wearing nothing but smiles. She had stumbled onto the nude beach. While trying to maintain eye contact, she tried to tell them that she was there to watch her husband, who was out on a bird rock. *Sure.*

Escape from the Rock.

About the time the pileup started to die down the surf was picking up. Brian and I were getting nervous, and we had no idea about how we were going to get off the rock in one piece. When no callers were heard, we started packing.

With everything in its can we moved the gear to the side of the rock. The surf was quite rough. With no other options, we threw the boat into the water. I tied off one rope and Brian held the other. Water was coming over the side. All I could do was jump for it. The boat looked like a backyard wading pool, and I fell in with a splash. As fast as he could, Brian transferred the motor and the rest of the gear before jumping in himself. We paddled like mad to reach open water. By some miracle we weren't sinking. The motor kicked in and we plowed through the swells. For the next 45 minutes we swatted the flies that were also trying to escape. On us. What a relief it was to crawl onto the dock!

Was This Fun?

I remembered all the gear, but I forgot to bring along a hat. As I peeled sunburned skin, I could reflect more positively on the whole operation. Only 132 contacts went into the log, but we worked stations on four continents. Tide levels wouldn't have allowed many more.

If we make a return trip, things will be easier and safer. I learned a lot. More plastic, less iron, and if it doesn't float, don't take it. For two short hours on the air the work and expense might seem out of place, but there can be no value placed on experience. Brian confirmed the fact that his father might be crazy. Clint got in some good rock climbing and Mary made new friends and was exposed to a new lifestyle. Everyone will be talking about this vacation for a long time to come.

Besides, I now have a new truck *and* a *Zodiac*. I'm sure we can find some interesting places to take them!

8705 Crystal River Way
Sacramento, CA 95828
email: n.wilson@worldnet.att.net

New Products

PORTABLE FLAMELESS HEAT GUN FROM WAHL

◊ Powered by a replaceable butane cartridge, Wahl's Micro-Therm portable flameless heat gun reaches an operating temperature of 1200 °F within 10 seconds. Use the lightweight gun to shrink tubing, activate adhesives, form plastics, bend PVC and so on. A heat deflector is provided for certain applications. A single butane cartridge provides about 20 minutes of continuous use.

Price: $27.95. For more information, contact Wahl Electronics, 2900 Locust St, Sterling, IL 61081; tel 815-625-6525.

By Kirk A. Kleinschmidt, NT0Z

Flea Market Madness! A Beginner's Guide to Buying and Selling

Take a trade show, a family reunion, a factory outlet mall, a multifamily garage sale, and spring break at Daytona Beach.... Add a liberal dose of ham radio and computers.... And you've got a modern hamfest. Enjoy. Here's how!

Like everything that incorporates technology, ham radio is experiencing its share of changes. Radios are smaller and have features we only dreamed of a mere decade ago. Sunspot cycles come and go (thankfully, the present cycle is perking up!), and a new crop of ham operators is making its mark on the hobby. To those with tunnel vision, the sky might seem to be falling. But change is one of the few constants in the universe, and no matter how the technological details ebb and flow, some aspects of our hobby remain the same.

Camaraderie, for example, is still an Amateur Radio hallmark. So is the tendency to gather for face-to-face meetings and fun—enhanced, perhaps, by ham radio's geographic diversity. The get-togethers detailed here are called hamfests by some, flea markets by others, and swapmeets by a few. The names are interchangeable. If you're a newcomer to the hobby, it's possible that you've never participated in one of these age-old Amateur Radio get-togethers. If so, you're in for a pleasant surprise. Why not pay a visit to your local hamfest? You're sure to have a good time, and you'll probably come away with a few more friends, a few new treasures and a slightly thinner pocketbook. In this article you'll learn some hamfest lore, how to find hamfests in your area, and how to successfully buy and sell Amateur Radio (and related) gear at these amazing ham radio get-togethers.

Hamfests—What's in it for Me?

Where can you find hundreds (sometimes thousands) of fellow hams, tons of bargain-priced radio and computer gear (including hard-to-find components and electronic assemblies), interesting forums and lectures, ham radio exams, and tasty grilled bratwurst sandwiches? Hamfests, of course. The exact mix of the things you're likely to find depends a lot on the kind of hamfest you're attending, its size, and to some extent, the region of the country.

Large multiday hamfests such as the annual Dayton Hamvention, or the many ARRL Division Conventions, attract thousands of hobbyists. Small regional or local hamfests may draw only a hundred. At Dayton, you'll find more than a dozen specialized forums; at a small hamfest in northern Minnesota, you probably won't find any. You will have fun, however, at both extremes.

Nearly every hamfest has a swapfest or flea market where individuals and commercial dealers hawk their wares. Generally, flea markets on both coasts will have more exotic hardware such as microwave assemblies and transistors, but prices overall will tend to be higher. Smaller Midwestern hamfests may not offer as much high-tech stuff, but you'll usually find a surplus of good, used HF gear. A transceiver that will fetch $700 in New England might sell for $500 in Iowa.

Many hamfests and flea markets—much to the chagrin of some—are piled high with computer stuff, from obsolete parts to new systems. Computer technology is forever merged with Amateur Radio, so worrying about the number of computer vendors at hamfests is a moot point. Why not take a look at everything?

When and Where?

Information on upcoming hamfests is available from several sources. Members of your local ham club will probably be "in the know." Hamfests tend to be annual events, publicized well in advance. Check your club's newsletter, packet BBS or Web page for announcements.

RICK LINDQUIST, N1RL

Hamfest flea markets are social events where you're likely to run into almost anyone.

RICK LINDQUIST, N1RL

CW keys, old and new. So many keys, so little time!

Buying Your First HF Rig at a Hamfest

Choosing your first rig can be confusing! The vast array of radios—new and used—is bewildering at best. Should you buy a brand-new whiz-bang rig with all the bells and whistles? Or perhaps a midrange rig in that cozy 4 to 8-year-old span where gear is still "awesome enough," yet much more affordable? You could also buy a brand new "beginner's rig," a relatively affordable modern radio that sports only the most essential functions. Or, if your budget is really tight, you could get lucky and come up with a well-cared-for older rig from the 1970s through the mid-1980s.

There are additional considerations. Do you even want a transceiver? Or will a separate transmitter-receiver pair be more to your liking? Are tubes okay, or do you need "solid state all the way"? Will the wall socket always power your rig, or is dc power desirable?

And what about size? Big, small or in between? Warranty? Service? It's not always an easy choice!

Radio Buying Tips

- Think about what you'll actually do with your shiny new (or lovingly used) radio. Analyze your interests, the bands you'll be using, the modes you'll be using, the power output you require (or can afford), and so on. If you'll always use SSB, buying a rig with an expensive built-in CW filter may be a waste of time and money.
- Shield yourself from the glare of hundreds of shiny, beckoning pushbuttons and gizmo switches. "Creeping feature-itis" can strike anyone, anywhere! Your first rig won't be your last, so go easy until you've had a chance to explore your new hobby a bit further. Then, with some experience under your belt, go for the gusto if you need more radio.
- Before trekking to the nearest hamfest, check out the "Product Review" column in *QST*. Nearly every mainstream radio made since the late 1960s has been reviewed there. You'll also get performance specs, features, a look at the controls and connectors—the whole nine yards. The League's *Radio Buyer's Sourcebooks*, Volumes 1 (1981-1991) and 2 (1991-1993), available from your local Amateur Radio dealer or from the ARRL, save you the trouble of looking through all those back issues. Each features the most popular rigs and accessories reviewed in *QST* over the years.
- Buying from a dealer—whether the rig's new or used—can be safer than buying from an individual. In addition to hardware, dealers offer information, service and a bit of security. Make sure the dealer you choose has a reasonable return period (a modest restocking fee is acceptable), and try to purchase your rig with a credit card, if possible. You'll be protected if the rig turns out to be a lemon.

As buyer or seller, never be afraid to negotiate. The posted price is almost never the final price!

Nationally, hundreds of hamfests and Amateur Radio events are listed in the "Hamfest Calendar" and "Coming Conventions" sections in *QST*. Listings usually appear a month or two in advance. You can browse *QST*'s hamfest listings electronically at **http://www.arrl.org/hamfests.html**.

When it comes to locations, you're likely to find hamfests held at hotels, schools, parks, National Guard armories, fairgrounds, or civic centers. Organizers usually host events at identifiable and accessible locations (although sometimes you'll wonder!).

Tips for Smart Shoppers

Because we think of hams as friends, it's difficult to think that we could never run into a bum deal at a hamfest. After all, these people are fellow hams! Although most individuals and commercial outlets selling hamfest gear are on the level, smart shopping and a healthy dose of preventive caution will help you avoid unwelcome surprises.

Here are a few tips for buying used radio or computer gear at hamfests:

- Budget your money. If you're at all typical, you don't have an unlimited budget for ham radio acquisitions. For some, going to a hamfest is like going to the candy store. If you're not careful, you'll go home with plenty of "candy" and no mortgage money. That's why it's a good idea to plan your spending in advance. Perhaps you can bring along a few pieces of gear to sell or swap—just in case you find a big-ticket item you just "have to have."
- Negotiating skills are helpful. If your expectation of ham radio flea markets is reminiscent of open-air Byzantine street markets, then you'll probably do just fine. Haggling over the price of used gear or components—in a friendly and generally reasonable manner—is appropriate and expected. Don't take the negotiating stage too far, however. If someone is selling a $5000 transceiver for $50, some out-of-control hamfest shopper will, no doubt, offer $45.
- Arrive early or stay late. The best hamfest deals are usually made in the first and last hours of each event. Getting to the hamfest early will allow you to snap up some of the best merchandise. If you wait too long, your favorite stuff may be all gone. Alternately, if you play the waiting game, sellers will be quick to discount stuff that did not sell previously.
- Always test expensive gear. If you're buying a major item such as a transceiver or receiver, make sure you're able to plug the thing in somewhere to see if it works. As mentioned previously, most sellers represent their merchandise accurately, but it never hurts to power up a potential acquisition.
- Returns? In a similar vein, make sure you get the seller's name, address and phone number—just in case. Although you don't expect to have major problems with a piece of gear you've thoroughly inspected and casually tested, it never hurts to be prepared. If the seller is truly compassionate, you may be able to negotiate a return policy. It never hurts to try!

Out With the Old and in With the New

If you're looking to upgrade your station equipment or accessories and you don't have tons of extra cash, why not take advantage of "flea market fever" by selling your existing gear at a hamfest to finance all or part of your new setup?

Whether you're a total greenhorn when it comes to hamfest salesmanship, or a somewhat seasoned veteran, the following tips will help you make the most of what is sometimes an intimidating experience: Selling stuff to other humans (well, hams!) face to face. Everyone wants a good deal (that's why they buy gear at hamfests in the first place!)—but you, the seller, need to make out okay, too. A win-win scenario is what you're looking for.

Tricks of the Trade

Selling ham gear for premium prices usually involves more than simply driving a hard bargain. Here's how to turn an average

RICK LINDQUIST, N1RL

You'll find used transceivers in abundance, but make your choices carefully.

Used Rigs to Consider

If you've decided to buy a used rig (for whatever reason), the radios listed here (far from comprehensive) are as affordable as any you'll find, work well on today's crowded bands, and can handle most specialty modes (check carefully to be sure they'll meet your needs):

- ICOM: Models IC-701, IC-720, IC-730, IC-740, IC-745 and IC-751(A). Prices range from $250 for the IC-701 to about $600 for the IC-751 or IC-751(A). They're all solid state and have many built-in features.
- Kenwood: Models TS-120, TS-130, TS-140, TS-180 and TS-430. Prices range from $300 to $600. They're all solid state and have many built-in features. Kenwood rigs with at least one tube: Models TS-520, TS-530 and TS-820. These are older and may require some "tweaking".
- Ten-Tec: Models 540, 544, Argosy, Argonaut (QRP, 5-W output), Omni series, Century 21 and 22 (Morse code only) and the Scout (compact beginner's radio; frequency limited, but a nice performer). Ten-Tec radios all are solid state, made in the United States and feature smooth, full break-in CW keying. Prices range from $100 to $500.
- Yaesu: Models FT-107, FT-301, FT-707, FT-980 and FT-747. All solid state. Tube models: the popular FT-101 series (older, may need "tweaking"), FT-102 and FT-901. Prices: $200-$700.
- Older rigs: These tube-type radios still can offer good performance—if they're working properly—although some operating flexibility is sacrificed. Look for Drake's TR-4 transceiver and the T4/R4 series transmitter-receiver combos, Heathkit's HW and SB series (will probably need "fixing") and Henry Radio's Tempo One and Tempo 2020 (both made by Yaesu and imported by Henry Radio), among others.—*NT0Z*

hamfest into an excellent sales experience:

- Appearance. That means, you, your table and your gear! Think of your hamfest table as a storefront. If you walked into your local Wal-Mart and found dirty, crusty merchandise strewn across the aisles and greasy-haired employees clothed in ripped up overalls, you'd probably turn around and walk out. Everyone feels comfortable shopping at Wal-Mart because the store is clean and brightly lit, the employees are neat, clean and friendly, and so on. The moral of this story? Make your hamfest table look like "the Wal-Mart table!" Clean up your gear, display it neatly and make index card signs for big-ticket items, listing the details and the price. Dress casually and presentably.
- Setup and location. Hamfests are like trade shows in the sense that the location of your table can sometimes make a difference in the number of potential customers who walk by. This is more important for large events, where you don't want to get stuck in some out-of-the-way corner or hallway with limited visibility and traffic.

Having ac or dc power available at your table can often help you make sales. Most hamfest buyers are afraid of buying a rig that has problems or doesn't work as claimed. Being able to demonstrate gear on the spot can be a big benefit. In addition, chattering radios and other gadgets in operation at your table attract more shoppers.

- Realistic pricing. This is a biggie! It's a hamfest, folks! Don't price your used (and sometimes abused) gear as though you were suddenly promoted to sales manager for Neiman Marcus! Remember the win-win scenario? Sentimental attachment doesn't promote sales. Be reasonable—that's how to sell stuff at hamfests.
- Talk it over. Many flea market attendees are tire kickers, but with a little salesmanship, many a tire kicker has been "persuaded" to take home merchandise. People like to joke, laugh and have fun (even hams!), so be sure to blurt something out when you catch someone peeking at the stuff on your table. This breaks the ice and sets the stage for friendly chatter—and potential sales.
- Negotiating. Nearly every flea market price is at least somewhat negotiable. People will ask you to sell your stuff for less than your asking price, they'll ask you for "volume discounts," and they'll ask you to accept trades.

You should at least be comfortable in jockeying your prices a bit, and if you can take a trade, that's just fine. It's your show, but by being flexible you'll be more successful. A 10 to 15% reduction in price seems about right. Anything more turns haggling into railroading! Don't wait for your customers to start haggling—you can get the ball rolling by offering a deal of your own. It works!

- Terms and guarantees. To ease buyers' fears of getting ripped off, represent your gear honestly and offer reasonable terms. Some sellers offer a five-day money-back guarantee, especially for big-ticket items, holding onto a customer's payment to make sure he or she is happy with the deal. Why would you want an unhappy ham customer (friend), anyway?
- Miscellaneous tips. (1) Arrive early! Many of your best sales will be to other sellers who relish the opportunity to examine everyone's stuff before the masses get through the gates. If you set up as early as possible, you won't have to try to sell and set up at the same time, and you'll be free to search for your own goodies to buy! (2) Be prepared for weather changes if your event is outdoors. (3) Bring a friend or helper so you're not tied to your table for the whole show. (4) Bring lots of change and dollar bills. (5) Accept local checks only, or checks from buyers you know personally.

Good Luck!

Hamfests are a wonderful part of Amateur Radio. They will sustain you through thick and thin. They will open doors to new pursuits. And they will expose you to interesting and handy-to-know friends and fellow hams. If you've never attended, get busy! If you live near a large metropolitan area, you can find at least one nearby hamfest almost every weekend. If you're in a more remote area, you'll have to plan ahead. Whatever it takes, you owe it to yourself to see what it's all about. You'll see me there, pawing through the weird stuff under the tables....

The author, a ham since age 13, was a QST *editor from 1988 through 1994. During his time in New England's "hamfest alley," Kirk dragged home dozens of "unbelievable" flea market finds. He now lives in Minnesota's lake country where he works as a technical writing/technical marketing consultant and freelance writer. He's a regular contributor to* QST.

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By Dave Miller, NZ9E

A PTT Repeater Box You Can Build

Need to switch a pile of external gear every time you key your mike? This is one handy gadget that's useful and easy to build. Once you've built yours you'll wonder how you ever got along without it!

What's a PTT Repeater Box and why do I need one? PTT, of course, stands for push-to-talk, a method of transmit/receive switching within your transceiver that's actuated by the pushbutton on your radio's microphone. Push the button to talk (transmit), release it to listen (receive). Your mike's PTT switch can generally be used only to key your transceiver. It isn't wise to use the same switch contacts to control linear amplifiers, RF preamplifiers, on-air lights, antenna transfer relays (to use separate transmit and receive antennas), or any other equipment that needs to be keyed in sync with your transceiver.

Most modern transceivers have a single set of isolated relay contacts available at the rear panel for switching peripheral equipment, but it's probably not safe to switch more than one external circuit with the built-in contacts.

If your station is a bit more elaborate and you need to switch several circuits during each transmit/receive cycle, the PTT Repeater Box should be just what you've been looking for. You can customize the Box to suit your needs, incorporating as many isolated relay contacts as necessary (adding future relays is simple, too).

One additional use might be to switch the audio to your station speaker on during receive and off during transmit. For example, my DSP unit often "talks back" to me while I'm transmitting. Apparently, enough of my transmitted RF signal is being picked up by the DSP's input circuits, causing the filter to squawk while I'm talking.

In addition to being distracting, a small portion of this distorted audio can be picked up by my station microphone and appear as distortion on my transmitted signal. Simply interrupting the DSP's audio output while transmitting seems to be the simplest solution to the problem, so one set of contacts on my PTT Repeater Box does just that! Other contacts switch my linear amplifier's keying input, my outboard RF preamplifier, and any other accessories that I might add at a later date.

I decided to use four of the double-pole, single-throw (DPST) relays specified, giving me a total of seven isolated PTT outputs (one set of contacts is used to replace the original PTT contacts in the microphone). The relays were bargain priced at just 99 cents each, or 10 for $7.90. Any 12-V dc relay can be used as long as the contacts are normally open and the contact ratings are appropriate for the equipment you'll be switching (the relays shown in the parts list are rated for switching 250 V dc and 1 A of current).

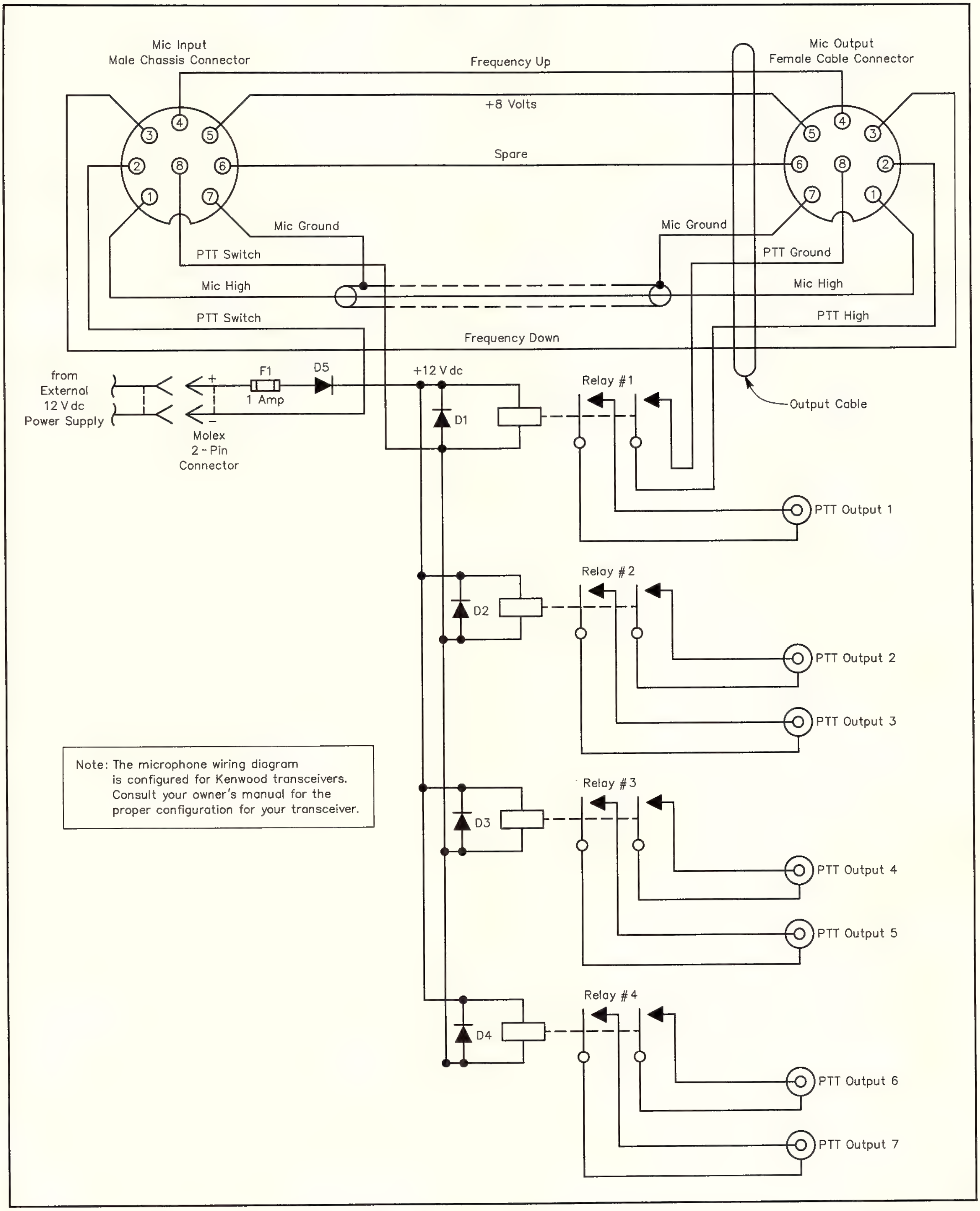
The PTT Repeater Box is easy to build from scratch, making it an ideal weekend project, even for beginners. The main part of the project consists of the four 12-V dc relays (relays that are actuated by applying 12 V dc to the coils) and a matching number of output connectors to make the switched contacts available for use elsewhere.

For my equipment it was convenient to simply plug my normal station microphone directly into the PTT Repeater Box as shown in Figure 1. By using the microphone itself to do the initial switching (rather than the transceiver's accessory PTT contacts), I can use the same PTT Repeater Box for several transceivers at once by plugging the PTT box's output into the transceiver currently in use. All accessories, for all bands, are switched simultaneously.

As shown in schematic diagram in Figure 1, the mike audio enters via the 8-pin male microphone connector and is routed directly out of the box, along with any other control functions (such as up/down frequency control), via a mike extension cable and an 8-pin female connector.

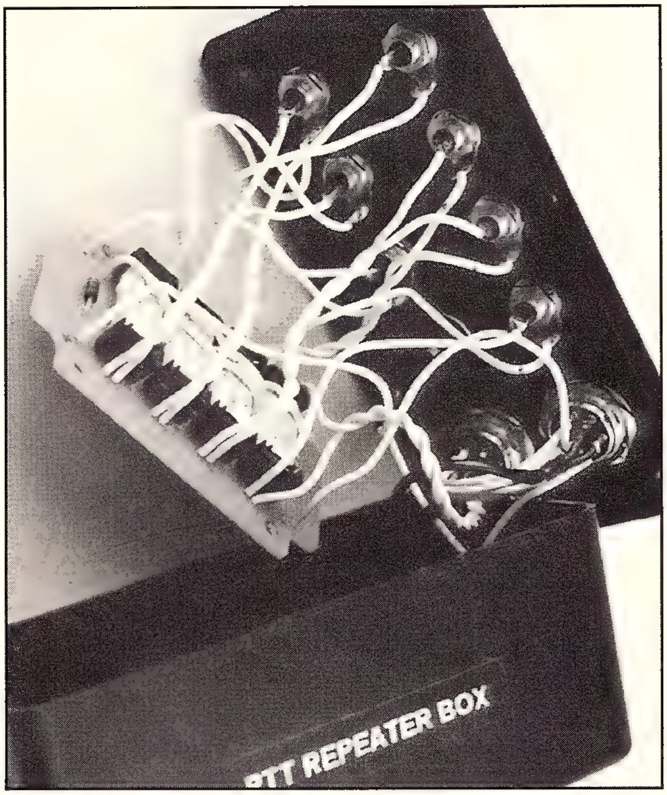
Only the microphone's PTT switch is diverted within the PTT Repeater Box to control the relays. The first set of isolated contacts is used to key the transceiver's PTT line, so that set of contacts exits the enclosure via the output microphone cable and connector. At this point, we're basically back to where we started—all of the original microphone signals, plus a set of isolated PTT contacts for keying our transceiver. All of the other isolated PTT contacts may now be used to key other peripherals, as many as you like, depending only on how many relay contacts you've built into your PTT Repeater Box.

You can add or delete relays from the total illustrated in Figure 1. All of the relays are simply wired in parallel, and because each relay (of the type specified) draws only about 30 mA, the total current should pose no problem for your mike's PTT switch. The only caution is that you must use a microphone that has a mechanical (rather than electronic) switch that is completely isolated from



Note: The microphone wiring diagram is configured for Kenwood transceivers. Consult your owner's manual for the proper configuration for your transceiver.

Figure 1—Schematic diagram of the PTT Repeater Box. Diodes and relays available from Jameco Electronics, tel 800-831-4242.
D1-D5—1N4005 silicon diodes (Jameco no. 76988) **Relays 1-4—12 V dc, 440-Ω coil, DPST (Jameco no. 134965)**



A peek inside the PTT Repeater Box.

other circuits (most microphones are set up this way).

The 12-V dc needed to power the relays can be obtained from an appropriately rated "wall cube" or from your main 12-V dc station/transceiver supply. The dc power enters the PTT Repeater Box via the two-pin Molex connector, with the positive lead on pin 1. Fuse F1 will open if a defect occurs inside the PTT Repeater Box, and diode D5 provides reverse-polarity protection.

Diodes D1 to D4 are connected across the relay coils to help suppress inductive transients produced when the relay coils are energized. The isolated outputs (1 through 7) are terminated in coaxial-style RCA phono connectors. I've kept the shells of these connectors floating above ground to avoid potential ground loops between various pieces of switched equipment. Using a non-metallic box is the easiest way to accomplish this. Alternatively, using insulated grommets to mount each phono connector in a metal box should work equally well. The relays themselves can be mounted on a small piece of perforated circuit board, which is mounted in the enclosure with short stand-off insulators.

Now, simply run insulated phono cables to all of your peripheral equipment that requires a PTT closure—and you're done! The PTT Repeater Box should last for many years and will be a handy accessory whenever you reconfigure or add to your ever-expanding station!

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QST

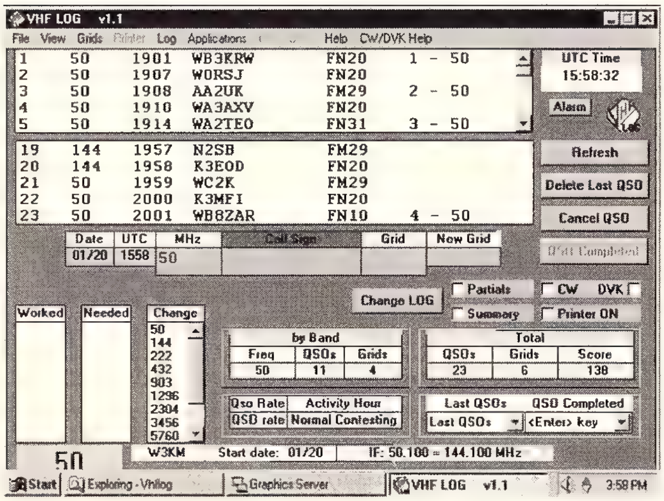
New Software

VHF LOG FOR WINDOWS V 1.1

Reviewed by Steve Ford, WB8IMY
Managing Editor

VHF Log was developed by Dave Mascaro, W3KM, as a contest-logging package specifically designed for VHF operators. It accommodates contest logging for single operator, multioperator and rover-class stations.

Dave is a member of the Mt. Airy VHF Radio Club in the Philadelphia area—better known as the Packrats—and *VHF Log* was originally intended with northeast contesters in mind. You still see this reflected on a portion of the station setup screen in which a pull-down selection menu offers only FN and FM grids. (You can enter your grid square suffix manually, however.) You'll find a number of other program features tailored to Packrat stations. There is even a portion of *VHF Log* that tallies other Packrats you've worked. This is not a terribly useful feature to a ham in, say, California, although he might meet a few Packrats during big 6-meter band openings in the next couple of years! Despite the obvious bias toward the northeast in general and Packrats in particular, *VHF Log* has something to offer every VHF/UHF contester, regardless of where you live.



```
1    50   1901  WB3KRW     FN20    1 - 50
2    50   1907  W0RSJ      FN20
3    50   1908  AA2UK      FM29    2 - 50
4    50   1910  WA3AXV     FN20
5    50   1914  WA2TEO     FN31    3 - 50

19   144  1957  N2SB       FM29
20   144  1958  K3EOD      FN20
21   50   1959  WC2K       FM29
22   50   2000  K3MFI      FN20
23   50   2001  WB8ZAR     FN10    4 - 50
```

UTC Time 15:58:32

Date	UTC	MHz	Call Sign	Grid	New Grid
01/20	1558	50			

Worked

Needed

Change: 50, 144, 222, 432, 903, 1296, 2304, 3456, 5760

by Band		
Freq	QSOs	Grids
50	11	4

Total		
QSOs	Grids	Score
23	6	138

Qso Rate	Activity Hour
QSO rate	Normal Contesting

Last QSOs	QSO Completed
Last QSOs	<Enter> key

50

W3KM Start date: 01/20 IF: 50.100 = 144.100 MHz

VHF Log has a number of handy features. The QSO rate graphs, multiplier and score displays pop on and off the primary screen as needed. *VHF Log* will use your sound card to save your vocal chords when you enter the digital voice keyer mode (up to four prerecorded WAV files can be played). *VHF Log* will also key your transceiver and send CW exchanges, either stored text or "live" from your keyboard. Are you into microwave competition? *VHF Log* keeps track of microwave activity in an exclusive section of the program. It also accepts 6-digit grid square designations.

You can keep track of the grid squares you've worked through various "maps," including a national map. I should point out that these maps are not at all similar to more detailed presentations such as the ARRL Grid Locator map. Instead they are composed of grid-square designators arranged to roughly mimic the shapes of maps. As you work a grid square, the type changes from black to white. A true grid map display would have been a nice addition, but it isn't really necessary. All you really care about is knowing which grid squares you've managed to work during a contest. *VHF Log*'s "maps" fulfill that purpose adequately.

Changing bands is simple; just a point-and-click operation. The entire log is displayed at the top of the screen and your last five QSOs are visible immediately beneath it. Dupe checking is automatic when you enter a call sign. If you're using a transverter with another transceiver, *VHF Log* will display the IF frequency offset for you—in case you forget in the heat of battle! And for those contesters who have other lives beyond their shacks, *VHF Log* even has an alarm clock you can set to remind you that it's time to pay attention to your family, keep your dentist appointment or whatever. At the end of the contest *VHF Log* can write to disk in standard ASCII format, or give you a hard-copy printout.

Minimum system requirement is a 486/66 PC running Windows 3.1 *or 95 with 4 Mbytes of RAM and at least 1.5 Mbytes of hard disk space. You can download a demo version of* VHF Log *on the Web at* ***http://www.qsl.net/w3km****, or order the software by mail. Send $50 to: Dave Mascaro, 1603 Mink Rd, Ottsville, PA 18942.*

QST

By H. Ward Silver, N0AX

Test Your Knowledge!

The trials of real life do not always come in multiple-choice format!

Sometimes, just defining the problem is the hardest part of finding a correct solution. This month's quiz presents several problems in a format that requires juggling the necessary information to find the answer.

1. A PACSAT is going to make a pass overhead later today and you have a 550 Kbyte file to send to a friend in Germany. Your average uplink speed is usually about 1400 bytes/second and the satellite will only be visible for 8 minutes. Will you be able to send the whole file in a single pass?

2. You want to run a sloping 80-meter dipole that's 132 feet long from the top of a 75-foot tree to a fence post along one edge of your yard. If the fence posts are 6 feet high, how far away is the nearest post to which your dipole can be attached?

3. To do some transmitter testing you need a dummy load. The transmitter output power is 125 W and the tests will be run with a keyer making a long string of dits (50% duty cycle). For safety, the dummy load should only be run at $^2/_3$ of its rated power dissipation. What is the smallest rated power dissipation for the dummy load?

4. The new 2-meter antenna you bought has 4.5 dB more forward gain than your old one (fed with RG-213 coax). You'd also like to mount it at the top of that 120-foot tower you just put up, replacing the old 20-foot push-up mast. If you feed the new antenna with RG-213 coax, which has a loss of 3.1dB/100 feet at 2 meters, will it radiate it more effective power than the old one?

5. Ouch! That new AM broadcast facility down the street has a strong harmonic that is smack-dab on top of your favorite DX frequency—their engineer measured 30 µV at your receiver. Maybe an antenna with a null in the pattern can help. To reduce the harmonic to the noise level, which is S4 at your station, how much attenuation do you need at 6 dB per S unit if a 50 µV signal is S9 on your receiver?

6. A new tower requires a base of no less than 2.5 cubic yards of concrete. The area available for you to dig the hole is 3 × 4 feet. How deep does the hole have to be to hold the required volume of concrete?

7. You just bought a box kite to raise an end-fed wire antenna that's 128 feet long and made of #20 copper wire. 345 feet of wire weighs in at one pound. In addition, you intend to use an end insulator that weighs 2 oz along with 1 oz of fishing tackle. The box kite will lift $^1/_4$ oz per MPH of wind speed to a vertical angle of 45°, your minimum design angle. The weatherman says winds at the beach are a steady 25 MPH. Will your airborne antenna be a success?

8. Time to put the new rig in the car. On full-power transmit, the radio draws 22 A. The rig's manual says not to operate the radio at less than 11 V. The auto's manual says that the alternator will maintain a normal battery at a minimum voltage of 12.5 V. You have on hand some #12 wire to connect the rig to the car battery. You'll need to run 8 feet of wire to each battery terminal and #12 copper has a resistance of 0.0016 Ω/foot. Is #12 heavy enough to do the job?

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Total Your Score!

There are a total of eight possible answers in this quiz. Give yourself one point for each correct answer.

7—8	You have terrific problem-solving skills!
4—6	A good score for a tough quiz.
1—3	Hmmm...better go back to multiple-choice tests.

Answers

1. Part of the trick in calculating the answer is in realizing that one Kbyte is 1024 bytes, *not 1000 bytes*! So, 8 min × 60 sec/min = 480 sec ×1400 bytes/sec = 672000 bytes. Divide 672000 bytes by 1024 to get 656.25 Kbytes. Yes, you can send the whole file with a bit of margin to spare.

2. You can use the Pythagorean Theorem to find the answer to this one. The vertical side of the triangle is 75 – 6 = 69 feet. The hypotenuse is 132 feet. Now plug in the numbers and "run" the theorem:

$$\sqrt{\left(132^2 - 69^2\right)}$$

The closest fence post that can be used is 112.5 feet from the tree

3. 125 W × 50% = 62.5 W average power. 62.5 W ÷ $^2/_3$ = 93.75 W required dissipation. A 100-W unit will be adequate.

4. The extra coax length = 120 – 20 = 100 feet. Extra loss = 3.1 dB/100 feet × 100 feet = 3.1 dB. Net gain = 4.5 – 3.1 = 1.4 dB. The answer is yes, but just barely. The added height will give your performance a substantial boost, however.

5. The interfering signal is 20 x log(30 µV / 50 µV) = 4.4 dB below S9. The desired level is S9 – S4 = 5 S units × 6 dB/S unit = 30 dB below S9. The attenuation needed is 30 – 4.4 = 25.6 dB.

6. 2.5 cubic yards = 2.5 × 27 cubic ft/yard = 67.5 cubic feet. The area of the top side of the hole = 3 × 4 = 12 square feet. The depth of hole = volume / top area = 67.5 / 12 = 5.6 feet. Start shoveling!

7. Total antenna weight = (128 ft / 345 feet/lb) × 16 oz/lb = 6 oz. Total lift weight = 6 oz + 3 oz = 9 oz. Lift available = $^1/_4$ oz/mph × 25 mph = 6.25 oz. Better stay home and wait for higher wind speeds—or build a bigger kite

8. The allowable voltage drop is 12.5 – 11 = 1.4 V. The total voltage drop is equal to 0.0016 Ω/ft × 8 ft × 2 = 0.026 × 22 A = 565 mV drop. Yes, you can use the #12 wire.

Product Review

Edited by ***Rick Lindquist, N1RL*** *• Senior Assistant Technical Editor*

Yaesu FT-847 HF/VHF/UHF Transceiver

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In the high-stakes poker game that characterizes the Amateur Radio industry today, Yaesu has significantly raised the ante with the debut of its FT-847 HF/VHF/UHF transceiver. For the first time in ham history we have a single radio that covers all HF bands plus the three most active VHF/UHF bands right out of the box! (Yaesu's earlier FT-767 offered similar capabilities but required optional modules—*Ed.*)

This everything-in-one-box trend was pioneered several years ago when ICOM combined HF, 6 and 2 meters in a single rig and created the IC-706. It was an instant hit. Other manufacturers quickly followed suit with HF radios that also included 6 meters and, in some cases, 2 meters. In rolling out the FT-847 Yaesu has trumped the competition by adding 70 cm and satellite capability. The FT-847 certainly represents the state of the art in one-stop transceiver shopping. But how does this revolutionary rig really measure up? Let's take a look.

Styling, Ports and Controls

The FT-847's styling departs from the traditional "shoebox" look. This transceiver is sleek and dark with a low vertical profile. The '847 is compact and fits easily on any desktop. It is a bit bulky for installation in smaller automobiles, but it should fit well in most sports utility vehicles and intermediate-sized cars. Unlike some mobile-friendly radios, however, the '847's front panel does not detach for remote mounting.

An assortment of buttons and knobs crowd the front panel, but even my thick fingers could navigate this ergonomic forest with little difficulty. The FT-847 display is extremely bright and crisp (you can adjust the brightness through eight different levels). The blue-on-white characters are easy on the eyes, regardless of the viewing angle. For the visually impaired Yaesu has thoughtfully added the ability to verbally announce the frequency display through the use of the optional FVS-1A voice unit. To activate the FVS-1A, you simply press the front-panel **VOICE** button.

Metering is incorporated into the left-hand side of the LCD display. There is an S meter, an FM discriminator meter, and a *real* RF power output meter calibrated in watts (not just a relative output meter). There is no SWR metering, something that's become practically a staple in modern radios, but there is a **HI SWR** indicator on the display. When using the FT-847 with the optional ATAS-100 multiband mobile antenna system, the meter scale shows reflected power instead.

The front panel controls include the usual suspects, such as concentric AF and RF gain knobs, RF power output, microphone level, receiver incremental tuning (labeled **CLAR** for "clarifier"), IF shift, and a numeric keypad. You'll also find a control to adjust the CW keyer speed (a welcome improvement over rigs that hide this function in a menu system) and a set of concentric knobs and companion buttons for the DSP functions.

The primary VFO knob is dead center on the panel. Concentric with this knob is the *Shuttle Jog* ring. You can make enormous frequency changes very quickly by grasping the ring and gently rocking it clockwise or counterclockwise. Think of it as a frequency "fast forward/reverse" control. At first, it seemed awkward, but I soon mastered the necessary movements. From that point onward, Shuttle Jog was the only way to fly! The **MEM/VFO CH** knob also permits quick frequency excursions according to the step size selected.

One front-panel control that users remarked about was the single **MENU** button. This provides simple, quick access to the radio's additional features.

BOTTOM LINE

Yaesu may have one-upped the competition with the FT-847. Here's an all-in-one HF through UHF transceiver package that couples lots of features and reasonable performance across the board with a price tag that many hams will find hard to resist.

You'll find the headphone jack on the front panel, where it should be. The headphone jack requires a $^1/_4$-inch plug.

On the '847's rear panel you'll find no fewer than *four* antenna jacks: HF, 6 meters, 2 meters and 70 centimeters. (The 70-cm jack is a female N connector; the others are SO-239s.) The menu lets you redirect 6-meter signals (transmit and receive) through the HF antenna port, eliminating the need for an external diplexer when using a combined HF/6-meter antenna.

The FT-847 does not have an internal automatic antenna tuner, even as an option. Yaesu does offer the FC-20 external autotuner, however, for HF through 6 meters.

Surrounded by the antenna jacks on the rear panel is a small cooling fan. There's a second cooling fan near the front panel, and the two fans work in concert—what Yaesu calls a "push-pull" cooling system. These fans run continuously. Some reviewers complained that the fans were noisy, saying that it reminded them of a loud fan in a computer power supply. Others didn't seem to mind the high-pitched whine at all. Like everything else, it boils down to a matter of personal preference.

Among the other rear-panel jacks are separate ports (these are mini-DIN style jacks) for VHF/UHF packet (1200 or 9600 baud) and HF digital modes. The HF **DATA IN/OUT** data jack does double duty as the fixed-level audio output. The computer-control port (CAT) is represented by a 9-pin DB-9 jack. You *do not* need an external interface to connect the FT-847 to your computer, but you must use *a null-modem* cable rather than a straight serial cable. Convenient as this CAT function is, there is a substantial fly in the ointment. See the

Table 1

Yaesu FT-847, serial number 8C020205

Manufacturer's Claimed Specifications	***Measured in the ARRL Lab***		
Frequency coverage: Receive, 0.1-30, 36-76, 108-174, 420-512 MHz; transmit,1.8-2, 3.5-4, 7-7.3, 10.1-10.15, 14-14.35, 18.068-18.168, 21-21.45, 24.89-24.99, 28-29.7, 50-54, 144-148, 420-450 MHz.	Receive, 0.5-32(see text), 35-76, 108-174, 420-512 MHz; transmit, as specified.		
Power requirement: Receive, 2 A; transmit, 22 A (100W output).	Receive, 2 A; transmit, 20 A. Tested at 13.8 V.		
Size (height, width, depth): 3.4×10.2×10.6 inches; weight, 14.4 pounds.			
Modes of operation: SSB, CW, AM, FM, AFSK.	As specified.		
Receiver	*Receiver Dynamic Testing*		
SSB/CW sensitivity, bandwidth not specified, 10 dB S/N: 1.8-30 MHz, <0.25 µV; 50-54 MHz, <0.2 µV; 144-148, 420-450 MHz, <0.13 µV.	Minimum discernible signal (noise floor), 500 Hz filter:		
		Preamp off	*Preamp on*
	1.0 MHz	–129 dBm	–134 dBm
	3.5 MHz	–131 dBm	–137 dBm
	14 MHz	–131 dBm	–136 dBm
	50 MHz	–134 dBm	–140 dBm
	144 MHz	–140 dBm	–142 dBm
	432 MHz	–139 dBm	–141 dBm
AM sensitivity, 10 dB S/N: 0.5-1.8 MHz, <20 µV; 1.8-30 MHz, <2 µV; 50-54 MHz, <1 µV.	10 dB (S+N)/N, 1-kHz tone, 30% modulation:		
		Preamp off	*Preamp on*
	1.0 MHz	2.4 µV	1.2 µV
	3.8 MHz	1.9 µV	0.8 µV
	50 MHz	1.0 µV	0.6 µV
	120 MHz	1.3 µV	0.5 µV
	144 MHz	0.6 µV	0.4 µV
	432 MHz	0.8 µV	0.5 µV
FM sensitivity, 12 dB SINAD: 28-30 MHz, <0.5 µV; 50-54 MHz, <0.25 µV; 144-148, 420-450 MHz, <0.2 µV.	For 12 dB SINAD:		
		Preamp off	*Preamp on*
	29 MHz	0.7 µV	0.3 µV
	52 MHz	0.4 µV	0.2 µV
	146 MHz	0.2 µV	0.2 µV
	440 MHz	0.3 µV	0.2 µV
Blocking dynamic range: Not specified.	Blocking dynamic range, 500 Hz filter:		
		Preamp off	*Preamp on*
	3.5 MHz	114 dB	109 dB
	14 MHz	114 dB*	109 dB*
	50 MHz	114 dB*	112 dB*
	144 MHz	103 dB*	96 dB*
	432 MHz	105 dB*	98 dB*
Two-tone, third-order IMD dynamic range: Not specified.	Two-tone, third-order IMD dynamic range, 500 Hz filter:		
		Preamp off	*Preamp on*
	3.5 MHz	92 dB	90 dB
	14 MHz	95 dB	89 dB
	50 MHz	89 dB	90 dB
	144 MHz	88 dB	84 dB
	432 MHz	85 dB	83 dB
Third-order intercept: Not specified.		*Preamp off*	*Preamp on*
	3.5 MHz	+6.1 dBm	–0.5 dBm
	14 MHz	+12 dBm	–0.7 dBm
	50 MHz	+0.9 dBm	–5.5 dBm
	144 MHz	–11 dBm	–19 dBm
	432 MHz	+2.6 dBm	–6.5 dBm
Second-order intercept: Not specified.	Preamp off, +12.4 dBm; preamp on, +14.7 dBm.		
FM adjacent channel rejection: Not specified.	20 kHz channel spacing, preamp on: 29 MHz, 82 dB; 52 MHz, 80 dB; 146 MHz, 69 dB; 440 MHz, 68 dB.		

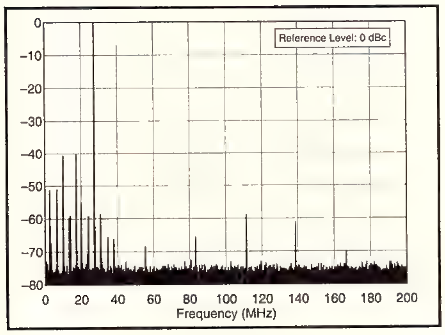

Figure 1—Worst-case spectral display of the FT-847 transmitter during spectral purity testing. Note the multiple spurs appearing just below the –40 dBc legal threshold for spurious emissions at full output power on this frequency. The transceiver was being operated at 100 W output at 28.0 MHz.

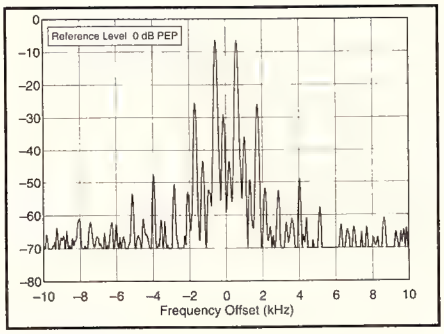

Figure 2—Worst-case spectral display of the FT-847 transmitter during two-tone intermodulation distortion (IMD) testing on HF. The worse-case third-order product is approximately 28 dB below PEP output, and the worse-case fifth-order product is approximately 51 dB down. The transceiver was being operated at 100 W output at 28.350 MHz.

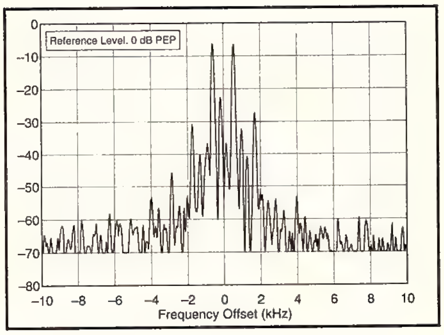

Figure 3—Worst-case spectral display of the FT-847 transmitter during two-tone intermodulation distortion (IMD) testing on VHF/UHF. The worse-case third-order product is approximately 28 dB below PEP output, and the worse-case fifth-order product is approximately 46 dB down. The transceiver was being operated at 50 W output at 432.2 MHz.

FM two-tone, third-order IMD dynamic range: Not specified.	20 kHz channel spacing, preamp on: 29 MHz, 77 dB; 52 MHz, 76 dB; 146 MHz, 69 dB*; 440 MHz, 68 dB*; 10 MHz channel spacing, preamp on: 52 MHz, 107 dB; 146 MHz, 89 dB; 440 MHz, 82 dB.
S-meter sensitivity: Not specified.	S9 signal at 14.2 MHz: preamp off, 65 µV; preamp on, 20 µV; 52 MHz, preamp off, 45 µV; preamp on, 15 µV; 146 MHz, preamp off, 22 µV; preamp on, 9.1 µV; 432 MHz, preamp off, 39 µV; preamp on, 12 µV.
Squelch sensitivity: SSB, 0.5-1.8 MHz, <20 µV; 1.8-30 MHz, <2 µV; 50-54 MHz, <1 µV; 144-148, 420-450 MHz, <0.5 µV; FM, 28-30 MHz, <0.25 µV; 50-54 MHz, <0.2 µV; 144-148, 420-450 MHz, <0.16 µV.	At threshold, preamp on: SSB, 14 MHz, 0.5 µV; FM, 29 MHz, 0.2 µV; 52 MHz, 0.1 µV; 146 MHz, 0.1 µV; 440 MHz, 0.1 µV.
Receiver audio output: 1.5 W at 10% THD into 8 Ω.	2.4 W at 10% THD into 8 Ω.
IF/audio response: Not specified.	Range at –6dB points, (bandwidth): CW-N (500 Hz filter): 121-902 Hz (781 Hz); CW-W: 130- 2135 Hz (2005 Hz); USB-W: 138-3103 Hz (2965 Hz); LSB-W: 160-3143 Hz (2983 Hz); AM: 110-2930 Hz (2820 Hz).
Spurious and image rejection: 60 dB.	First IF rejection, 14 MHz, 122 dB; 50 MHz, 54 dB; 144 MHz, 123 dB; 432 MHz, 84 dB; image rejection, 14 MHz, 95 dB; 50 MHz, 96 dB; 144 MHz, 97 dB; 432 MHz, 55 dB.
Transmitter	*Transmitter Dynamic Testing*
Power output: HF & 50 MHz: SSB, CW, FM, 100 W (high); AM, 25 W (high); 144 & 420 MHz, 50 W (high); AM, 12.5 W (high).	HF & 50 MHz: CW, SSB, FM, typically 107 W high, 1.5 W low; AM, typically 28 W high, 3 W low; 144 & 432 MHz: CW, SSB, FM, typically 50 W high, 1.5 W low; AM, typically 13 W high, 1.5 W low.
Spurious-signal and harmonic suppression: ≥40 dB on HF for harmonics, ≥50 dB for spurious; ≥60 dB on VHF & UHF for harmonics and spurious.	HF, 41 dB (see Figure 1); 50 MHz, 63 dB; 144 and 432 MHz, 70 dB. Meets FCC requirements for spectral purity for equipment in its power output class and frequency range.
SSB carrier suppression: ≥40 dB.	As specified. >50 dB.
Undesired sideband suppression: ≥40 dB.	As specified. >55 dB.
Third-order intermodulation distortion (IMD) products: Not specified.	See Figures 2 and 3.
CW keyer speed range: Not specified.	10 to 41 WPM.
CW keying characteristics: Not specified.	See Figure 4.
Transmit-receive turn-around time (PTT release to 50% audio output): Not specified.	S9 signal, 12 ms.
Receive-transmit turn-around time (tx delay): Not specified.	SSB, 12 ms; FM, 11 ms. Unit is suitable for use on AMTOR.
Composite transmitted noise: Not specified.	See Figures 5 and 6.
Bit-error rate (BER), 9600-baud: Not specified.	146 MHz: Receiver: BER at 12-dB SINAD, 1.1×10^{-3}; BER at 16 dB SINAD, 4.0×10^{-5}; BER at –50 dBm, $<1.0\times10^{-5}$; transmitter: BER at 12-dB SINAD, 2.1×10^{-4}; BER at 12-dB SINAD + 30 dB, $<1.0\times10^{-5}$. 440 MHz: Receiver: BER at 12-dB SINAD, 1.1×10^{-3}; BER at 16 dB SINAD, 4.0×10^{-5}; BER at –50 dBm, $<1.0\times10^{-5}$; transmitter: BER at 12-dB SINAD, 8.9×10^{-4}; BER at 12-dB SINAD + 30 dB, $<1.0\times10^{-5}$.

Expanded Product Review Report Available

The ARRL Laboratory offers a detailed test result report on the Yaesu FT-847 that gives in-depth, technical data on the transceiver's performance, outlines our test methods, and helps you to interpret the numbers and charts. The report even includes a summary of how this radio stacks up with similar, previously tested units. Request the *FT-847 Test Result Report* from the ARRL Technical Department, 860-594-0278; e-mail **mlevesque@arrl.org**. It's $7.50 for ARRL members and $12.50 for nonmembers, postpaid.

Note: Unless otherwise noted, all dynamic range measurements are taken at the ARRL Lab standard spacing of 20 kHz.
*Measurement was noise-limited at the value indicated.
Third-order intercept points were determined using S5 reference.

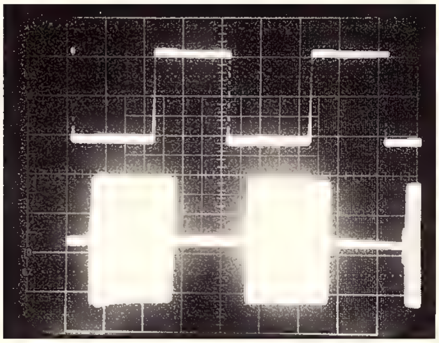

Figure 4—CW keying waveform for the FT-847 showing the first two dits in semi-break-in mode. The equivalent keying speed is 60 wpm. The upper trace is the actual key closure; the lower trace is the RF envelope. Horizontal divisions are 10 ms. The transceiver was being operated at 100 W output at 14.2 MHz.

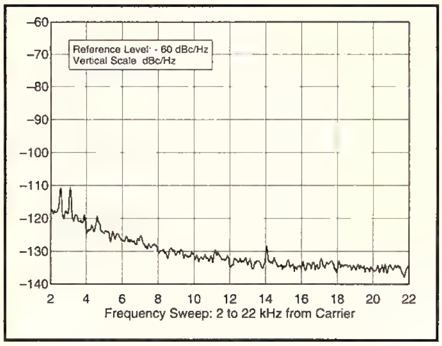

Figure 5—Worst-case tested spectral display of the FT-847 transmitter output during composite-noise testing on HF. Power output is 100 W at 3.5 MHz. The carrier, off the left edge of the plot, is not shown. This plot shows composite transmitted noise 2 to 22 kHz from the carrier.

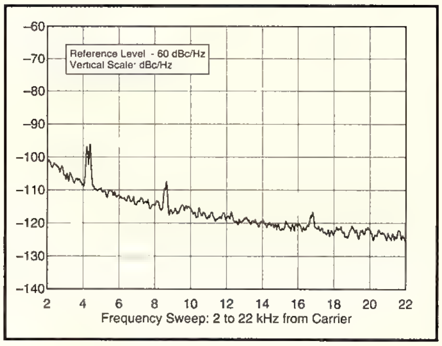

Figure 6—Worst-case tested spectral display of the FT-847 transmitter output during composite-noise testing on VHF/UHF. Power output is 50 W at 432.2 MHz. The carrier, off the left edge of the plot, is not shown. This plot shows composite transmitted noise 2 to 22 kHz from the carrier.

sidebar "The CAT's Meow?"

The rear panel also offers an ALC port, a PTT jack (in case you want to use a foot switch to key the rig), and an external speaker jack. Speaking of speakers, you'll find one on the top panel. The audio is clear and smooth—among the best audio we've heard from a transceiver in a long time. The **AF GAIN** control acted a bit strangely, though. On all three units we looked at, there was no audio at all for the first quarter turn, at which point it sprang to life. Yaesu says it has addressed this problem in current production.

Last but not least on the rear apron is the dc power connector (you must provide your own ac supply). Yaesu's dc power cord, comprised of four, separate wires, did not make a favorable impression. At the very least, the whole assembly should have been secured with cable ties.

It's possible to install up to three optional Collins mechanical filters in the FT-847. A 500-Hz CW filter, the YF-115C, can be installed in the 455 kHz second IF. We purchased the optional CW filter. Since the radio is capable of full-duplex satellite operation, Yaesu offers optional SSB Collins mechanical filters for both receive and transmit to replace the stock ceramic filters in the second IF. Yaesu says the transmit filter should yield flatter, more natural-sounding audio. We did not install nor test these optional SSB filters, however.

HF Performance

The FT-847 generates 100 W output on 160 through 10 meters in the CW, SSB and FM modes, and 25 W on AM. In the HF range, it also receives continuously from 100 kHz to 30 MHz, but in the ARRL Lab, we found that useful sensitivity actually begins around 500 kHz or so.

In the "nice touch" department, we'd like to note that the FT-847 is the first amateur transceiver we know of that includes provisions to transmit on the Alaska emergency communications frequency of 5167.5 kHz.

Operation is straightforward and intuitive. I had it on the air the first time in under a minute without referring to the manual. You simply plug in the hand-held microphone (supplied), push the **POWER** button, push the button for your favorite mode (SSB, FM, AM or CW), turn up the microphone and RF gain controls as necessary, select your frequency, and you're all set!

Audio reports on the voice modes were excellent, even when running the speech processor. By pressing the **MONI** button you can listen to melodious sound of your own voice in your headphones. This is a neat feature that you usually find only on more expensive radios. (When you're using too much speech compression, you'll know right away!) The missing element, puzzling as it may seem, is the voice-activated switch or VOX. Not all operators will bemoan the lack of a VOX, but DXers and contesters certainly will. (On the other hand, the '847 does have a *MOX*—manually operated switch—which is convenient when testing or making adjustments.) Yaesu says it considered including VOX but decided against it because of the FT-847's primary application as a satellite radio.

The built-in electronic keyer acquitted itself well on CW, although the keyer speed shifts quite a bit with just minor movements of the front-panel control. This makes it difficult to set the speed exactly where you want it. The keyer does not have any message buffers (memories). The '847 doesn't support full break-in either. You can set the T/R delay to as little as 10 ms, but that's as close as you'll get to QSK, and then you'll have to put up with the clattering of the T/R relay (the maximum delay is 300 ms). On CW, the **MONI** button enables or disables the sidetone.

One terrific feature for CW fans is the spotting function. Even newbies can use this tool to easily and accurately zero beat with the stations they intend to call. It's sometimes amazing how many CW QSOs you'll still find where stations are sometimes hundreds of Hertz apart because of faulty zero beating. This can be annoying, especially if there are more than two stations on frequency. It also means the QSO is taking up more room on the band than it needs to.

On RTTY and PACTOR I, the FT-847 turned in a good performance. Transmit/receive turnaround was more than sufficient for excellent long-distance PACTOR operating. The '847 does not offer an FSK mode with narrow filters; this is strictly an AFSK rig. But with the DSP filters you can narrow the audio bandwidth considerably. This isn't as desirable as having a narrow filter in the IF, but it is acceptable for all but the most crowded conditions. The FT-847 manual strongly advises against running full output in the RTTY mode. In fact, Yaesu recommends that you throttle the output down to about 50 W when operating RTTY.

The FT-847's overall HF reception is good, but not stellar. For the sake of comparison, the dynamic range numbers (both blocking and two-tone, third order IMD) of Yaesu's FT-920 were slightly better on HF (see "Product Review," *QST*, Oct 1997). The transceiver is sensitive enough for casual operating, and its selectivity is adequate in that respect as well. Under crowded band conditions (during a contest, for example), the '847's HF receiver showed its weakness. Nearby signals hammered the AGC, and it soon became obvious that '847's dynamic range characteristics were not up to the task. Then again, Yaesu isn't marketing the '847 as a contest radio. If it were a high-performance HF contest rig, you'd also expect to shell out quite a few more dollars for the pleasure of owning it.

The FT-847's transmit IMD performance on HF (see Figure 2) was quite good on most bands. The worst case was 10 meters, one of only two HF bands where the third-order IMD products poked above –30 dB (the other was 12 meters). Especially noteworthy, however, was the fact that third-order IMD products were down by around 40 dB on some lower bands, and fifth and higher-order products were substantially down across the HF range—in all cases more than 40 dB and approaching 50 dB on 40 and 20 meters!

Bird Watching

One irritant our reviewers noticed was a proliferation of internally generated signals—"birdies"—on several HF bands. Birdies were audible even with the antenna disconnected. Fifteen meters was the worst. We suspected a problem with the particular '847 we had purchased, so we bought another radio. No such luck. The birdies were present on the second rig as well, although they were not as prominent as they were on the first unit, and they were on different frequencies. In addition, we'd noted that both radios, while spectrally legal, did not meet Yaesu's –50 dB specification for spurious and harmonic emissions and had numerous spurs (see Figure 1). The consensus was that we definitely had a problem, but its nature was not entirely clear.

We'd bought our two FT-847s from different dealers and at slightly different times. Nonetheless, judging from the close serial numbers, both radios appeared to be from the very same production run—probably made on the same day and pretty early in the game to boot. To get another perspective, we borrowed yet another FT-847 from a dealer. This one was from a more recent production run, and it harbored hardly any birdies.

We contacted Yaesu, providing the manufacturer with spectral purity charts and outlining our experience with the receiver birdies. Yaesu determined that the birdies resulted from poor soldering flux removal on the DSP board (go figure). Removing the flux residue scattered the birdies.

The spectral purity issues—not at all related to the birdies—turned out to be of greater concern to Yaesu and led to considerable head scratching on both sides of the Pacific. Yaesu finally determined that the spurs were related to "variations in the interstage drive levels" and said that "slight changes to three components" brought our unit back into specification. We did not get our FT-847 back from Yaesu in time to verify this before our review went to press, however. Yaesu says that, while this was not a widespread problem in FT-847 production, customers who experience out-of-spec spur levels may return their units to Yaesu for "warranty relief, per the terms of our one-year limited warranty." If the last FT-847 we examined is any criterion, birdies and spectral purity should not be an issue in current production.

DSP

On the plus side, the '847's DSP functions are outstanding. The automatic notcher is especially impressive, but it reacts more slowly than many external boxes, taking up to a half-second to vanquish offending carriers. The autonotch even worked on the internal birdies that we'd noticed, but it won't help you on CW because the notch will zap the signals you want as well as the ones you don't! The NR (noise reduction) function eliminates much of the tiresome background hash. It does so without introducing so much of the hollow processing echo often heard in other DSP noise reduction filters. One gripe: Yaesu put the NR level on the menu instead of making it a front-panel control. Some ops felt that adjustment would get more use than, say, mike gain, which *is* on the front panel.

By manipulating the high/low-cut bandpass filter controls, you can tailor the DSP filtering performance to meet the precise need of the moment. Very nice! The only problem is that when you're in CW, the DSP shifts into a mode that does not permit adjustment of the dual bandpass! The DSP filtering does a creditable job of simulating a narrow passband—even without the optional Collins mechanical filters—but some users said they wanted the ability to adjust the bandwidth manually too. It's worth noting that the non-DSP noise blanker did a fine job on impulse noise. This is particularly important for mobile operating.

IF shift is a genuine asset in the FT-847, although most ops would welcome a center detent for the control. The AGC can be toggled from fast to slow at the press of a button. The clarifier (RIT) is also pushbutton activated and adjusted with a knob immediately beneath, but it takes a bit of cranking to move very far. When you tweak the clarifier the main frequency display reflects the change. This means you can't tell right away where you started out, and there's no way to clear the RIT offset with a button press. The '847 does not offer XIT (transmit incremental tuning).

Like most modern transceivers, the '847 provides dual VFOs and copious memories (about 80 in all). What the '847 adds to this milieu, however, is extremely smooth and precise tuning. You can tune easily in 1-Hz steps; that's the default minimum. You can even tune in as little as 0.1 Hz increments if you desire!

VHF/UHF Performance

On SSB, CW and FM, the FT-847 cranks out 100 W on 6 meters and an impressive 50 W on 2 meters and 70 centimeters. Receive coverage spans 36 to 76 MHz (great for monitoring European TV to check the MUF and to listen on the UK 4-meter band), 108 to 178 MHz, and 420 to 512 MHz. In the ARRL Lab, we found there was poor sensitivity on some frequencies outside the ham bands—36 to 37 MHz, for example.

On 6 meters, 100 W is more than enough power for all but the most challenging work. On 2 meters and 70 cm, 50 W is adequate for local/regional communication and for most satellite work, depending on the type and location of your antennas. In both cases, the output is plenty to drive an external amplifier. After using the FT-847 during the June VHF QSO Party, one user wished for the ability to preset power levels on different bands so he'd always have the right amplifier drive level when switching from, say, 6 meters to 2 meters.

The CAT's Meow?

The Yaesu FT-847 offers the time-honored *CAT* function—computer aided transceiver. Simply put, it is a port that allows your computer to control your radio. The CAT implementation in the '847 is especially handy because no interfaces or level converters are required. You just hook up your computer and you're in business. The CAT in the FT-847 has a problem, though, and it isn't related to fleas or hairballs.

The way the port is currently programmed, the communications path between the '847 and your computer is essentially one-way—from your computer to the '847. The computer can send commands to the radio, but it can get precious little information *from* the radio. Contest and logging programs could send commands for frequency and mode changes, for example, but could not poll the rig to determine the frequency or mode the operator had chosen. Remote-control software would encounter the same problem.

This is a serious shortcoming but, fortunately, Yaesu says it is updating this firmware to read back operating frequency and mode. It is hoped that the revised CAT port program will be available as a ROM upgrade for current FT-847 owners.

On FM the FT-847 is a full-featured radio *par excellence*. You can store all of your favorite repeater pairs and simplex frequencies in the abundant memory channels along with offsets and CTCSS tones. If you really want to get into paging, the '847 grants your wish with a versatile DCS (digital coded squelch) function. The FT-847 even has crossband split capability, although this is a one-way "simplex" feature. That is, you can repeat from 2 meters to 70 cm, for example, but the rig will not automatically relay the response from 70 cm back to 2 meters (semi-duplex). To get full duplex, you have to be in Satellite mode. More on that later.

The scanning functions are not limited to VHF/UHF. These include programmable band scans and memory channel scans. The *Smart Search* will scan for signals and place them into memory automatically, a really handy feature if you take the FT-847 on the road. And, of course, there is the ubiquitous *priority channel* scan. This can be put to use to make up for the lack of a dual watch capability, so you can have the radio keep an ear on, say, a calling frequency on one band while you operate on another frequency or band altogether.

Packet is more than an afterthought on the FT-847. Yaesu engineers obviously paid careful attention to tailoring the transmit and receive response for optimum 1200 and 9600-baud performance. All you have to do is hook up your TNC to the rear panel jack, then select 1200 or 9600 baud via the menu.

When it comes to so-called "weak-signal" SSB and CW operating, the receiver characteristics to a degree mirrored what we had experienced on HF. How individual users view this performance depends on what they're used to. In terms of VHF/UHF preamp-on sensitivity, the FT-847, Yaesu's 1990-vintage FT-736R, and ICOM's IC-821H are in the same ballpark (the '847's preamp adds 2 dB to 6 dB). But when it comes to dynamic range (see Table 1), the FT-847 is head-and-shoulders better than its older sibling FT-736R, comparable to the IC-821H on the two bands they have in common (2 meters and 70 cm) and well short of the Yaesu FT-920's approximately 100 dB on 6 meters. That said, we want to make it clear that we consider this level of performance entirely acceptable for 90% of the terrestrial VHF/UHF operating that you're likely to encounter.

You can add external preamps at the antenna, which is always a good idea at VHF and UHF. If you go this route, the '847 can provide 12 V dc at the 2 meter and 70 cm antenna jacks. This option is accessible via the menu.

By the way, an important attribute for weak signal VHF/UHFers wanting to operate portable or mobile is the frequency accuracy at various outside temperatures. This is particularly important at 70 cm. The FT-847's basic accuracy is 2 ppm between 0 and 40° C (32 to 104° F). At 440 MHz, this amounts to a nearly 1 kHz error, and the accuracy at even colder or warmer extremes is 5 ppm. That's a whopping 2 kHz error at 440 MHz! Yaesu says the transceiver actually may outperform these specs "by a considerable margin," but this is especially noteworthy since Yaesu does not offer a temperature-compensated crystal oscillator (TCXO) option.

Contests will present the greatest challenge for the FT-847 at VHF and UHF. We used the rig during the ARRL Spring Sprints—not a terribly active string of contests—and found that the '847 sometimes didn't tolerate adjacent signals very well (we observed both "crackling" and AGC pumping).

This handicap would become serious during popular rough-and-tumble slugfests such as the VHF QSO Parties. But if you're not a *serious* contester, this aspect of the FT-847 is of little importance.

Transmit IMD performance (see Figure 4) on VHF and UHF was quite acceptable, with third-order products hovering around –30 dB and fifth and higher-order products at or approaching –50 dB on 2 meters and 70 cm!

Satellite Operation

As its marketing suggests, the FT-847's strong suit is as a satellite radio. It seems to be Yaesu's answer to those satellite operators who've eagerly awaited a successor to their legendary FT-736 transceiver. It is also a substantial shot fired across the bow of the popular ICOM IC-821H. One op who owns a '736 found the '847 simpler to use.

When you place the '847 in the **SAT** (satellite) mode, it becomes a very different kind of radio. Suddenly you have full-duplex crossband capability (the subband frequency is displayed along with the main band) as well as dual VFOs that can be yoked together for easy frequency tracking—in either direction. For example, on satellites that have *inverting transponders,* such as Fuji-OSCARs 20, 29 and the upcoming Phase 3D, an increase in the uplink frequency results in a decrease in the downlink frequency. (The reverse is also true.) With a properly configured FT-847, an upward tweak of the uplink (transmit) VFO automatically shifts the downlink (receive) VFO by the same amount. This removes much of the confusion from inverted-transponder operating.

On the air, I had no difficulty hearing and working Fuji-OSCAR 20 on SSB. Switching to FM, I worked the AO-27 FM repeater satellite easily. For several minutes during the pass I enjoyed full-quieting signals. Thanks to the FT-847's flexible crossband capability, I was even able to work RS-15 on Mode A (2 meters up, 10 meters down). All of these contacts were made using omnidirectional antennas. (For those who may be wondering, the FT-847 is *not* able to work its full-duplex crossband magic between 15 meters and 10 meters for RS-12 on Mode K! You can, however, store a 10-meter and a 15-meter frequency in memory for simplex crossband operation.) Another Mode A user reported some downlink signal degradation when using the FT-847 in SAT mode that he did not experience when using his FT-736R as a transmitter and the FT-847 as the receiver. Mode B, however, was "crystal clear."

The FT-847 is a very strong competitor to the IC-821H. Not only does the '847 provide most of the same features, *it includes 6 meters and HF*. For a few hundred dollars more on the price tag, the FT-847 is going to look very attractive to those in the satellite community. The only item I would add to my FT-847 wish list is the ability to reduce output below 1 W for use with external transverters. Even without a "transverter port" the '847 will probably make a worthy platform for those who want to step up to microwave operating when Phase 3D finally reaches orbit—as long as you can "pad down" the output to acceptable levels.

Conclusion

The Yaesu FT-847 definitely breaks new ground in the ham transceiver marketplace. Its "hits" are numerous and include the superb user manual. This manual is one of the best we've seen in many years. It even includes tutorials on using the '847 for high-speed CW meteor scatter and moonbounce! The misses, such as the receiver birdies in the first two units we looked at, *CAT* programming problems, and lackluster selectivity, are mild annoyances. For the casual operator who wants everything in one stylish box, you can't go wrong with the FT-847.

Our thanks to Rick Lindquist, N1RL; Peter Budnik, KB1HY; Emil Pocock, W3EP; and Mike Tracy, KC1EX, and Ed Hare, W1RFI, of the ARRL Lab for their contributions to this review.

Manufacturer: Yaesu USA, 17210 Edwards Rd, Cerritos, CA 90703, tel 562-404-2700; fax 562-404-1210. *Manufacturer's suggested list prices:* FT-847, $2399; ATAS-100 mobile antenna system, $349; FVS-1A voice unit, $43; optional Collins mechanical narrow filters, $173; FC-20 external autotuner, $299.

ICOM IC-T8A Multiband Hand-held Transceiver

Reviewed by Rick Lindquist, N1RL
Senior Assistant Technical Editor

That funny noise you began hearing early this year was the collective groans of the competition as ICOM's IC-T8A began showing up at retailers. ICOM—the same company that blew everyone away a few years ago with the now seemingly ubiquitous IC-706 (and followed it up last fall with the IC-706MkII)—now has another first. It's the world's smallest *triband* hand-held that includes 6 meters (Standard's C-568A, for example, covers 2 meters, 70 cm, and 23 cm). So, you could say the IC-T8A is without peer—so far at least.

For this particular review, we're making a bit of an exception for an exceptional product. Typically, we review H-Ts and VHF/UHF mobiles in groups of peer products—dual-band hand-helds, 2-meter mobiles, etc. ICOM debuted its three-band IC-T8A just weeks shy of the deadline to include it in our last review of dual-band hand-helds (see "Product Review," *QST*, April 1998)—which we would have had to retitle to "multiband," in any event. Since interest has been pretty high in this unit, we're singling it out here so our readers won't have to wait until the next comparison review.

Besides being a "first," the IC-T8A is exceptional because it offers a great deal at an economical price—just a bit more than ICOM's own IC-T7A or IC-W32A (see "Product Review," *QST*, July 1997) dual-banders. In addition to 6 and 2 meters plus 70 cm, you get gobs of receiver coverage outside the ham bands—including the aircraft, 150, and 450-MHz public safety bands plus (as if you'd even *expect* more) FM and TV broadcast channels. There are some gaps, however. More on that later.

The T8A is the first H-T we've seen that includes an NiMH battery pack as standard equipment. The clamshell-style 9.6 V, 680 mAh NiMH battery pack comprises about one-half of the unit's depth. Several users commented that the battery does not snap snugly onto the transceiver's back.

With a PC, an optional cloning cable, and optional model CS-T8 cloning software, you can assign memory names of up to four characters. The current software is DOS only. As this review was going to press, we learned that ICOM soon will debut a *Windows* version, CSW-HH4, estimated to sell for around $50. Another optional cloning cable lets you copy the memories of one T8A into another.

The first thing a lot of hams like to do when they try out an H-T is to see how it fits in their palm—and maybe to heft it a bit—to get a feel for what it would be like to use it on a regular basis. The T8A fits nicely into either palm, depending on whether you prefer to actuate the **PTT** button with your thumb or your forefinger. Any larger and it would not be nearly as, well, *handy*.

It has a rugged, water-resistant case, and the unit conforms to *MilSpec* shock and vibration standards. The keypad buttons are slightly recessed to avoid accidental activation.

The display features $^1/_4$-inch tall letters. Some might wish for the display to be a bit larger and bolder, but it's easy to read under typical lighting conditions, and you can set one of two contrast levels. The unit offers backlighting for nighttime viewing of the display (but not of the keypad buttons). The "auto" lamp setting illuminates the display every time you press a button (the other settings are "on" and "off").

Gone are the days when a couple of concentric rotary controls adorn the top of every H-T. The IC-T8A sports a single rotary control, the multifunction **DIAL** knob. This is used for tuning, selecting user-settable menu functions or memories, and changing scan direction among other things. All other controls are pushbuttons, including the **VOL**ume and squelch (**SQL**) controls. Radio purists may decry the fact that the T8A uses buttons to adjust the volume (a trend pioneered a few years ago by Alinco and now becoming much more common), but no one found it inconvenient. You get a graphic display of the relative volume level as you adjust—a bit like the remote volume adjustment on many modern TV sets.

The IC-T8A has an automatic squelch, but you also can select one of eight "manual" squelch levels or open (ie, no) squelch. Pushing and holding the **SQL** button opens the squelch, too. The **SQL** button and the **PWR** button are the smallest ones on the unit and very close together—in the lower and upper lefthand corners of the display window. Their location makes these buttons very easy to locate, even in the dark, but some users wished for bigger buttons.

Overall, getting acquainted with the IC-T8A is pretty painless, especially if you're familiar with other recent-vintage ICOM gear. Even if you're not, the *Instruction Manual* is quite helpful, and especially the Panel Description and Basic Operation

Table 2—ICOM IC-T8A, serial number 1479

Manufacturer's Specifications	*Measured in ARRL Lab*
Frequency coverage: Receive, 50-54 MHz, 118-174 MHz, 400-470 MHz; transmit, 50-54 MHz, 144-148 MHz, 440-450 MHz	Receive, 50-200, 400-1000 MHz, cell blocked (see text), transmit, 50-54 MHz, 140-150 MHz, 430-450 MHz.
Power requirements: 4.5-16 V dc. Receive, 250 mA; transmit, (max, high power), 1.8 A.	Receive, as specified; transmit, 1.4 A. Tested at 13.8 V dc.
Size (HWD): 4.2×2.3×1.1 inches; weight 9.5 ounces.	
Modes of operation: FM (transmit and receive), WBFM and, AM (receive only).	As specified.
Receiver	*Receiver Dynamic Testing*
FM sensitivity, 12 dB SINAD: 0.18 µV.	For 12 dB SINAD: 52 MHz, 0.15 µV; 146 MHz, 0.16 µV; 440 MHz, 0.15 µV.
WFM sensitivity, 12 dB SINAD: Not specified.	For 12 dB SINAD: 98 MHz, 1.2 µV.
AM sensitivity: Not specified.	10 dB (S+N)/N, 1-kHz tone, 30% modulation; 120 MHz, 0.4 µV.
Two-tone, third-order dynamic range: Not specified.	52 MHz, 55 dB*; 146 MHz, 53 dB; 440 MHz, 52 dB; 10 MHz offset: 52 MHz, 70 dB; 146 MHz, 80 dB; 440 MHz, 66 dB.
Adjacent channel rejection: Not specified.	20 kHz offset: 52 MHz, 55 dB; 146 MHz, 60 dB; 440 MHz, 59 dB.
First IF and image rejection: VHF, 60 dB; UHF, 50 dB.	IF rejection, 52 MHz, 62 dB; 146 MHz, 107 dB; 440 MHz, 119 dB. Image rejection, 52 MHz, 78 dB; 146 MHz, >143 dB; 440 MHz, 66 dB.
Squelch sensitivity: 0.18 µV.	At threshold, 52 MHz, 0.37 µV; 146 MHz, 0.16 µV; 440 MHz, 0.11 µV.
S-meter sensitivity: Not specified.	52 MHz, S9=0.9 µV; 146 MHz, S9=1.3 µV; 440 MHz, S9=2.1 µV.
Audio output: 250 mW into 8Ω, THD not specified.	281 mW at 6% THD into 8Ω.
Transmitter	*Transmitter Dynamic Testing*
Power output (H/L): with BP-200 battery pack, 4.5 W; with external supply, VHF and UHF, 5 W / 0.5 W.	With BP-200 9.6 V battery pack: 52 MHz, 4.2 W / 0.6 W; 146 MHz, 4.6 W/ 0.5 W; 440 MHz, 3.2 W / 0.3 W With external, 13.8 V dc supply: 52 MHz, 6.3 W / 0.6 W; 146 MHz, 5.7 W / 0.5 W; 440 MHz, 4.1 W / 0.3 W
Spurious signal and harmonic suppression: 60 dB.	52 MHz, 68 dB; 146 MHz, 70 dB; 440 MHz, 64 dB. Meets FCC requirements for spectral purity.
Transmit-receive turn-around time (PTT release to 50% of full audio output): Not specified.	Squelch off, S9 signal, 52 MHz, 120 ms; 146 MHz, 100 ms; 440 MHz, 60 ms.
Receive-transmit turn-aound time ("tx delay"): Not specified.	52 MHz, 190 ms; 146 MHz, 120 ms; 440 MHz, 150 ms.

Note: Unless otherwise noted, all dynamic range measurements were made at the ARRL Lab standard spacing of 20 kHz.
*Measurement was noise-limited at the value shown.

chapters. Like the T2A and T7A, the IC-T8A includes ICOM's guide function—which acts like an on-line Help file. If you get stuck, just wait and text will crawl across the display to advise what you're supposed to do next. This can be *very* handy, especially if you don't plan to carry the manual around in your back pocket or pocketbook. Users liked the "no-function-button" setup for this radio.

Programming the T8A is easy, and some users were able to figure it out without resorting to the manual.

On-the-air audio reports were uniformly good, as long as you don't try to close-talk the microphone. The T8A includes topside jacks to add a speaker-mike if you want. The receive audio was remarkably robust for such a small speaker. It sounded surprisingly good even when listening to broadcast FM.

As you can see from Table 2, the T8A receiver covers a lot of real estate, so you can spend a lot of time just listening. Be advised, however, that even though the T8A will tune to frequencies outside of its specified coverage range, this does not mean you will be able to hear anything. For example, in FM-N, we found good sensitivity from 50 to 72 MHz, but it degraded sharply above that point (eg, 5.4 µV at 76 MHz). The T8A is especially numb between 200 and 230 MHz. In the ARRL Lab, we found no amount of signal could be received in this range, not even in the *millivolt* range, so forget even listening on 222 MHz.

By the way, we concur with ICOM and advise against attempting the mod making the rounds that enables transmit on 222 MHz. ICOM says this mod can damage the radio. Of course, modifying the radio voids the warranty, so why do it?

The unit does not tune between 230 and 300 MHz, and it's deaf as a stone between 300 and 400 MHz. There's another gap from 600 to 650 MHz. In FM-W, we measured 11.4 µV at 650 MHz and 3.4 µV at 800 MHz.

Reception modes were band or frequency-range specific. In other words, if you're listening to the aircraft band, you can only listen in AM mode. If you're in the FM broadcast band, you can only listen in WFM mode. You can independently set one of nine tuning steps for each band.

How does the T8A stack up in the critical areas of dynamic range and adjacent channel rejection? Performance in some cases was modest (see Table 2). We compared the ARRL Lab numbers for 2 meters and 70 cm with those of the four most recently reviewed dual-band units. At 20-kHz spacing, the T8A's 2-meter dynamic range was the worst of the five H-Ts—by 6 to 12 dB—while its 70 cm dynamic range was within 5 dB of the other units we tested. But, at 10-MHz spacing (an indication of immunity from so-called "intermod" from strong out-of-band signals), the dynamic range numbers on both bands compared quite favorably with the other H-Ts—within a few dB in most cases.

We saw a brighter picture in terms of adjacent channel rejection. The T8A was in the same ballpark with the other units on 2 meters and topped the field on 70 cm.

Table 3: ICOM IC-T8A Features

Extended VHF/UHF reception	Y
Aviation band reception (AM)	Y
Regular memory channels	100[1]
Memory naming (characters)	O[2]
Memory cloning	Y[3]
PC programmable	Y[2]
Programmed scanning	Y
Power-output choices	H / L
Low-battery indicator	Y
Lighted buttons	N
Automatic repeater offset	Y
Crossband split	N
Full duplex	N
Paging (code or tone squelch)	Y
Dual watch	N
DTMF autodialer (memories)	Y (9)
CTCSS tone scan	Y
Antenna connector type	SMA
Suggested retail price	$419
Typical selling price (as of 5/98)	$350

Key

Y = Standard

O = Optional

N = None or not available

[1] Plus 1 call channel per band and 20 band-edge channels.

[2] Using optional software and a PC.

[3] Cloning requires an optional cable and/or cloning software and a PC.

The T8A's top-loaded rubber ducky antenna is taller than the typical single or dual-band affair—it's almost three times taller than the radio. Even so, the antenna is pretty small when compared to a full-sized quarter wave antenna for 6 meters (which would be on the order of 4½ feet), so we did not expect it to be terribly efficient on the band. By all accounts, it was not.

The IC-T8A does not permit you to listen on two bands at the same time, nor can you set up a memory to transmit on one band and receive on another. You can, however, set the scan function to listen to all or selected memory channels, in order to monitor frequencies on the various bands. The T8A also includes tone scan. With just the touch of a single button, you can have the unit identify and display the frequency of a CTCSS tone.

When transmitting on 6 meters at high power, some users noticed a slight burning sensation. It turns out the users' palms were brushing the negative battery charge terminal on the back side of the unit. It was "hot" with RF while transmitting. We also found that one sometimes could experience the same sensation by touching the exposed metal chassis frame at the radio's base. Apparently, the conditions have to be just so for this to occur, and some users had no problem at all. ICOM says it was unable to duplicate this with any of its T8As. Unless using the optional wall or desktop charger stand, users experiencing this problem might want to apply some tape to the terminals and the exposed metal or (better yet) use the optional carrying case.

No one likes having to recharge their H-T all the time, and some full-power (ie, approximately 5 W) H-Ts can really suck down a battery pack. The NiMH battery pack on the T8A seemed to last and last, however. The T8A kept its cool during intermittent use, but it will get noticeably warm during extended periods of transmitting.

ICOM rates the T8A at 5 W output when using 13.8 V dc external power. Ours cranked out 6.3 W on 6 meters and 5.7 W on 2 meters, but just 4.1 W on 70 cm (a second unit measured 4.3 W). Output is rated at 4.5 W with the BP-200 battery pack. Our unit slightly missed the mark on 6 meters and by a wider margin on 70 cm, but it was on target on 2 meters (see Table 2). An optional BP-197 battery case that accommodates three alkaline batteries also is available, but it provides just 800 mW output.

Some might deduct points because ICOM does not offer crossband split, dual watch, and other features on this little unit, but for the money—around $350 on the street—it's a lot of radio and—as sportscasters and coaches love saying—it gets the job done. There's the usual raft of optional accessories too, including a carrying case, a headset, an assortment of speaker mikes, and various battery packs.

Overall, the we found the T8A to be a versatile, economically priced radio that many hams will want to get their hands on.

Thanks to Joe Bottiglieri, AA1GW; Peter Budnik, KB1HY; John Hennessee, N1KB; and Mike Tracy, KC1SX, and Ed Hare, W1RFI, of the ARRL Lab for their contributions to this review.

Manufacturer: ICOM America Inc, 2830 116th Ave NE, Bellevue, WA 98004, tel 206-454-8155; fax 206-454-1509; **http://www.icomamerica.com**. Manufacturer's suggested retail price: IC-T8A, $419; HM-46 speaker mike, $59; HM-75A remote control speaker-mike, $96; HS-85 VOX/PTT headset, $105, CS-T8 DOS cloning software, $13; OPC-478 PC cloning cable, $45; LC-147 leather carrying case, $24.

New Products

A PAIR OF 2-METER AMPS FROM MIRAGE

◊ Mirage's new B-510-G amplifier is loaded with "professional" features. Use it with any hand-held or base station transceiver in FM, SSB or CW modes. The B-510-G features adjustable power output from 5 to 100 W; a 5- to 15-dB gain GaAsFET preamp; a 15-dB attenuator; SWR, temperature and reverse-polarity protection circuits; and more. It's housed in a compact 6.5×2.25×9-inch enclosure with a wrap-around heat sink and a quiet cooling fan.

With its dual power input ranges, the Model B-320-G "BruteFORCE" amplifier can boost your hand-held or mobile rig to an amazing 200 W output on FM, CW and SSB. Features include a 15-dB GaAsFET preamp; SWR and reverse-polarity protection; and RF-sensed T/R switching. The amp is housed in a 7.75×2.75×9.75-inch enclosure with a wrap-around heat sink and a quiet cooling fan.

Prices: $224.95 (B-510-G); $449.95 (B-320-G). Both amplifiers are backed by Mirage's one-year warranty. For more information, see your local Amateur Radio products dealer or contact Mirage Communications, 300 Industrial Park Rd, Starkville, MS 39759; tel 800-647-1800, fax 601-323-6551; e-mail **mirage@mirageamp.com**; **http://www.mirageamp.com**.

NINE-BAND DIPOLE ANTENNAS FROM DYNAMIC ELECTRONICS

◊ Two multiband dipoles from Dynamic Electronics cover all the ham bands from 160 through 10 meters with SWR bandwidths of 2:1 or less on each band. The DP-9 multiband antenna consists of nine full-size dipoles fed from a single 50-Ω feed point (an SO-239 coaxial connector). The wire dipole elements, made from 12 and 14-gauge stranded, insulated wire, are held apart by PVC spreaders. The 240 foot antenna uses no traps and can handle maximum legal power.

A shorter version, the DP-9S, uses loading coils in the 160-meter elements, reducing the antenna's total length to 140 feet while reducing the 2:1 SWR bandwidth on that band to 30 kHz.

Prices: $189 (DP-9); $210 (DP-9S). Add $10 for shipping to all US locations. For more information, contact Dynamic Electronics, PO Box 896, Hartselle, AL 35640; tel 256-773-2758; fax 256-773-7295; e-mail **dei@whnt19 .com**; **http://www.hsv.tis.net/~dei**.

LOGIKEY K-3 FROM IDIOM PRESS

◊ New from Idiom Press is the Logikey K-3, a factory built version of the venerable Super CMOS III Keyer. In addition to typical keyer controls, the K-3 features six programmable, non-volatile memories (1530 characters total); selectable timing; a compensation circuit for full-break-in keying; auto spacing; automatic serial number insertion; beacon mode; and more. The keyer requires 12 V dc at 0.04 A.

Price: $129.95 plus shipping ($7 US; $12 DX). California residents add appropriate sales tax. No credit cards, no CODs. For more information, see your favorite Amateur Radio products dealer or send as SASE to Idiom Press, Box 1025 Geyserville, CA 95441, for a brochure.

Hints & Kinks

Edited by ***Bob Schetgen, KU7G*** *• Senior Assistant Technical Editor*

A SEMI-REMOTE

◊ Although I must stay in bed much of the time, I want to use my transmitter. Since I don't have any usable space at (or near) my bed for my Kenwood TS-850S/AT transceiver, I went semi-remote! This approach doesn't take much effort; just a little time and a few items that are easy to scrounge. You may have the required materials in your junk box. I know that this system works properly up to a distance of 40 feet, because that's the length I have.

For the remote-control box, I used a conduit type, electrical, single-device, deep "handy-box" with a $^1/_2$-inch knockout and a blank metal cover to match. The conduit box is smooth, with no sharp edges to catch on bed covers. Other *metal* boxes will work, but I'm a retired electrician, so the handy-box was my first choice. A "setscrew" $^1/_2$-inch Romex box connector and a short length of shrink tubing protects the cables and secures them to the box.

I drilled the blank cover with a $^3/_8$-inch hole for a phone jack and a $^1/_4$-inch hole for a miniature on/off switch.[1] A punched $^5/_8$-inch hole holds the microphone (male chassis) connector. The control box requires two cables. Each is a two-wire (#20 AWG), shielded cable.

Transmit Audio Connections

An 8-pin female microphone connector generally comes with the transceiver, but they're also available at Radio Shack and most ham stores. Matching male chassis connectors can be more difficult to procure.[2] Cable 1 carries the transmit audio. Connect:

- The audio-cable shield to pin 7 (**GND**) at both ends of the mike cable—and nowhere else!
- One of the shielded wires to pin 1 (**MIKE**) at *both* ends of the cable.
- The other wire to pin 5 (**+8 V**) at the transceiver and one side of the switch, at the handy-box.
- A short wire from the other side of the switch, to pin 5 of the chassis mike connector.

If your mike requires batteries, you can house them in a second handy-box bolted to the bottom of the main box (back to back). Close the second box with another blank cover. Use a $^1/_2$-inch chase nipple to carry wires between the boxes.

I leave the switch open and operate VOX on a fixed frequency. I use this system almost every night in a 75-meter SSB net and notice no problems. You can use this hookup with any transceiver, although the connections may vary.

I use a Kenwood 85 mike that has its own level control on the base. That eliminates problems with too much, or too little, speech power. (No other mike controls are used.) You can use other microphones. If so, the switch may control the mike should something such as a telephone call interrupt your operating.

Receive Audio

Cable 2 carries receive audio and ground connection. The TS-850 (and possibly others) is wired for a stereo phone plug. The receive-audio cable shield is the only ground conductor to the rig. The shield connects to the bottom of the handy-box, using a solder lug and a #10-32 machine screw at the box's existing tapped holes. The shield is soldered to the plug "ring" at the transceiver end. Both wires within the audio cable are connected as for a stereo connection. The receive-audio plug must connect to the transceiver for the remote box to be grounded.

I use earphones, because other people are trying to sleep in nearby rooms. The cables are taped together at about 3-inch intervals. This makes a nice, clean, installation.—*Jack G. Hollenbeck, W6JIC, 21110 Phoenix Lake Rd, Sonora, CA 95370*

SIMPLE CONVERSION OF THE HEIL DESK MIKE TO A BOOM MIKE

◊ I often use the space where my station is located to do work for my business, and it seems like the desk mike was always in the way. I didn't want to set it on top of the rig where it might fall, scratch something, etc. Remembering past articles about converting a desk mike to a boom mike, I decided to see if I had anything on hand that was "convertible."

Some time ago I purchased a pair of extension lights from a specialty furniture store in our area. They clamped on the rear edge of my desk for some time until eventually one wound up in the junk box simply because it was no longer needed. Upon close examination, I discovered a single-bolt end bracket that held the light assembly and was a virtually perfect match for my Heil dual-element desk mike.

I unscrewed the plastic clamp assembly that holds the mike to the desk stand and set it aside. Then I put both the desk mike base and support rod into separate plastic bags to protect them from scratches while in storage.

I removed the lamp assembly by cutting the electrical cord about four or five inches from the light socket and pulling the wiring out the back of the extension light. Then I got two matching washers to fill the space between the end bracket and the plastic mike holder and fitted all the parts together using the original bolt and nut from the light. The assembly is a perfect fit, and the total assembly time was less than 10 minutes, including the time to securely tie wrap the Heil microphone cord to the top of the extension assembly. I've seen similar desk lights at garage and yard sales for $1 or less on several occasions. Even if you don't have a spare lamp lying around, it's still a very inexpensive way to enhance your station. I now have a very attractive boom mike that moves completely out of the way whenever I am not using it. The cost is nil, and it will take only a few minutes to put the mike back on the desk stand should I ever decide to do so. Ham radio at its best!—*Michael Goins, WB5YJX, 1413 Pony Ln, Wallis, TX 77485*

SWITCHING FOR MOBILE POWER LEADS

◊ For best operation, some automobile manufacturers recommend that the dc power leads connected directly to the battery, with *both* leads fused. Nevertheless, there's a problem: Logically, any mobile radio should switch off when the ignition switch is off, both to prevent a dead battery and to prevent unauthorized transmissions. For this reason, I route the radio dc lines through a 12 V relay that is controlled by the ignition switch.

Here's how I did it: Connect a length of RG-8, through two fuses, to the battery (braid to the negative post). Run the RG-8 to an aluminum box mounted under the instrument panel. A panel-mount SO-239 works great to make the connection. Ground the box locally. Mount a 12 V relay (check its current capacity) in the box, and run a lead from the relay coil to the **ACCESSORIES** position of the vehicle fuse block. (Use a fuse-tap connector that matches the fuses in your vehicle. They're available from most auto supply stores.) Mount barrier-strip terminals on the box for as many transceivers as you may have (a +12 V and a matching ground terminal for each radio). Power your mobile rigs from this box and you will have an additional safety feature: The radios will be switched off whenever the starter is turning, thereby eliminating possible radio damage from low voltage and/or starter transients. This method also helps isolate the rig from the car's electronic circuitry, reducing the potential for RFI. However, test it before driving the car!—*Jim Forrester, K4JF, 122 Blackberry Valley Rd, Greenville, SC 29611; e-mail* **K4JF@aol.com**

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[1] For full control of the #85 (or other) mike, a six conductor cable, with shield, would be required. (I'd be tempted to use four conductors and include up [pin 4] and down [pin 3] frequency switches, but you need to see the transceiver display.—*Ed.*) I did not require it for my use. Do *not* ground the mike cable directly! To do so, would create a ground loop; hum or other problems could result. Some microphones may require a DPST switch to open the wire to pin 1 at the remote-end connector, also. Make no connections to pin 6 at either end of the mike cable.

[2] Amateur Electronic Supply lists the Vanco CBC8P 8 pin, male, panel-mount mike connector for $5.95 plus shipping and handling. Contact AES at any of their four stores (see the Advertiser's Index in this issue), tel BBS 414-358-3472; e-mail **help@aesham.com**; URL **www.aesham.com**.

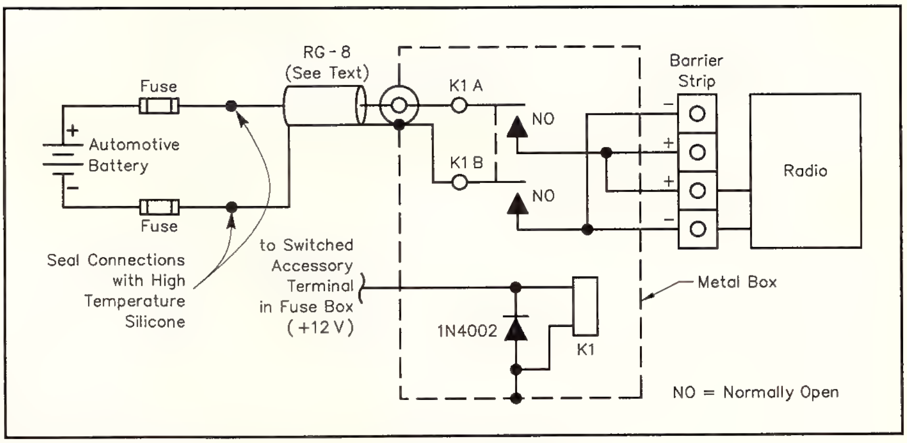

Figure 1—Details of WA4LHL's vehicle dc switching system.

Editor's Note: Some vehicle manufacturers no longer recommend connecting accessories directly to the battery. Follow your manufacturer's guidelines.

If you use several radios, you could supply each from its own relay.

According to the 1995 Belden catalog, RG-8 is an adequate dc conductor for only about 6 to 10 A (for 10°C to 35°C conductor temperature rise). In addition, the dielectric and jacket plastics are rated for 80°C (about 175°F), so route the cable in cooler areas of the engine compartment. I use three pairs of #16 AWG zip cord for my 100 W rigs. Belden supplies two-conductor cords with temperature ratings as high as 105°C.

By replacing the barrier strips with plug connections, you can easily swap rigs in and out of the vehicle.

MORE MOBILE INSTALLATION TIPS

◊ What a good item on installing a rig into a Corvette![3] I consider myself a "professional" ham because my job with the National Electricity Company here in Scotland means I help to look after over 1500 mobile radio installations in various autos from panel vans through snowcats. May I add a few suggestions for the ham installer?

GM installation guidelines instruct owners to route positive and negative leads directly to the battery terminals, but make sure that they are fused within six inches of the battery terminals. (See Editor's Note, above.) Put a fuse in each line. Use multistrand flexible cables of at least twice the current rating of your rig, especially if you intend to install the radio in the trunk. Why? Try measuring the voltage at the radio while transmitting. You'll be surprised how much voltage you can lose in 15 feet of "skinny" cables!

It does no harm to gently twist the power cables as you install them. This practice seems to help with RFI problems that involve a fuel-management unit.

You can dramatically improve installations on fiberglass bodies—auto, boat or RV—by gluing a two-foot square of very thin aluminum sheet under the intended antenna location. A stainless-steel nut and bolt just off the center gives you a good ground to the plate. You can then fit a $^1/_4$ or $^5/_8\ \lambda$ antenna normally.—*Mel Evans, GM6JAG, 56 Southhouse Rd, Edinburgh, EH 17 8 EU, Scotland*

USE FOR DEFUNCT RS-232 CONNECTORS

◊ The next time you see a box full of surplus RS-232 cables at a hamfest or flea market, don't pass them up if they're "cheap" and their pins are in good shape. They make great holding fixtures when you assemble your own RS-232 cables at home. Cut the cable from the old connector and place the connector in your vise or other "third hand" device. Insert the new connector into the old one. The old connector holds the pins of the new connector straight and correctly spaced, even if you apply a little too much heat to the pins while soldering wires to the connector.—*Denton Larson, WB0ZUR, 521 10th St SE, Waseca, MN 56093; e-mail* **dlarson@ic.waseca.mn.us**

FOAM PIPE INSULATION BLENDS ANTENNA INTO SCENERY

◊ Recently, a tree that was the support for one end of my dipole fell victim to ice. This problem was quickly remedied with a 20-foot telescoping mast. The mast did not blend in with the rest of the yard as well as the tree had, however. I did not want to paint the mast, so I looked for an alternative. A quick look in the garage provided the answer: I found two eight-foot sections of brown foam pipe insulation. With the insulation covering it, the mast blends in well with the other trees. The pipe insulation can also be purchased in gray or black. These colors may work better in other situations.—*James Tobola, KC5LDO, 8800 Fox Hollow Dr, Waco, TX 76712*

Hints and Kinks items have not been tested by *QST* or the ARRL unless otherwise stated. Although we can't guarantee that a given hint will work for your situation, we make every effort to screen out harmful information. Send technical questions directly to the hint's author.

QST invites you to share your hints with fellow hams. Send them to "Attn: Hints and Kinks" at ARRL Headquarters (see page 10), or via e-mail to **rschetgen@arrl.org**. Please include your name, call sign, complete mailing address, daytime telephone number and e-mail address on all correspondence. Whether praising or criticizing an item, please send the author(s) a copy of your comments.

VHF/UHF Century Club Awards

The ARRL VUCC numbered certificate is awarded to amateurs who submit written confirmations for contacts with the minimum number of Maidenhead grid-square locators (indicated in italics) for each band listing. The numbers after call signs refer to endorsements. The totals shown are for credits given from March 31, 1998 to May 29, 1998. The VUCC application form, field sheets and complete list of VHF Awards Managers can be found on the Web at **http://www.arrl.org/awards/vucc/**. Please send an SASE for this information if you cannot download it online. VUCC replacement certificates are available for $10 each. Lapel pins are available for $5 each. Do you have questions concerning VUCC? Contact us by e-mail at **vucc@arrl.org**.

Note: We are converting our VUCC records for digital processing and storage. Participants who endorse will begin to have their records converted to the new format. (To avoid a large backlog some endorsements may not be done immediately.) Please expect a delay in processing as we convert to this new system.

Compiled By Bill Moore, NC1L, Century Club Supervisor

50 MHz	
100	
947	KB6VFC
948	K6VDP
949	WB1FLD
950	KI8G
951	W3UUM
GM4ILS	175
G4SEU	375
W1WHL	400
WB1FLD	125
W3UUM	125
N3FA	125
KR4M	200
W4KXY	150
KB5WFE	125
KB6VFC	350
K6VDP	200
KB8RJS	125
KB8MBC	200
KI8G	250
144 MHz	
100	
550	N8ZJN
551	WA2HFI/0
552	W3UUM
W7HAH	450
KI8G	150
432 MHz	
50	
K3HZO	70
47 GHz	
5	
1	W2SZ
Satellite	
100	
81	WY4D

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[3] John Seybold, KE4PRC, "VHF/UHF Mobile in a Late-Model Corvette," *QST*, Oct 1995, pp 59-60.

Technical Correspondence

Edited by ***Paul Pagel, N1FB*** • *Associate Technical Editor*

MIKEMASTER UPDATE

By Marv Gonsior, W6FR, 418 El Adobe Pl, Fullerton, CA 92835 e-mail **w6frmarv@pacbell.net**

◊ This note refers to my article, "MikeMaster—A Microphone Preamplifier with Noise Gating and Compression."[1] I would like to apprise users who employ low-output-level microphones that they may find the unit does not perform properly with the 1:1 gain level setting as shown in the schematic diagram. To remedy this potential problem, enable the 20-dB amplifier section of the SSM2166 by removing jumper W1 and installing jumper W2, along with resistors R1 and R2 and capacitor C2. Following that, adjust R10, **GAIN ADJ**, accordingly.

Those who want to increase the unit's low-frequency audio response can do so by increasing the values of C6 and C7 to 10 µF.

Note, too, that ICOM rigs have a dc voltage on the mike jack, so you need to use a dc blocking capacitor to feed the transformer.

CRYSTAL SET TIPS

By Charles Cummings, K8VCZ, 63 Arden Rd, Columbus, OH 43214

◊ Beginning builders of crystal radios, such as the one described recently in *QST*,[2] may be discouraged by such a radio's poor selectivity. By experimenting with five pairs of headphones, I discovered a war-surplus pair having a dc resistance of 37 Ω provided adequate selectivity and volume. Other electromagnetic (not crystal) 8 to 2000 Ω headphones delivered poor selectivity and volume. Although a high Q is desired in the tuning circuit (L1, C3 of Figure 1 in the article), headphones should have a low Q.

I found it helpful to have adjustable taps on L1. I placed taps at positions between 5 and 10% above the ground end of the coil—5% for frequencies near 1600 kHz and 10% for those near 600 kHz.

For me, the best antenna for AM broadcast and shortwave versions of the crystal set is a 68-foot Windom, a high-impedance antenna. For convenience, I made the capacitor in series with the antenna (C2) adjustable from the front panel. It is adjusted for a low capacitance setting for stations near 1600 kHz and for a higher value of capacitance for stations near the bottom end of the band. Adding front-panel dials for C2 and C3 aid in returning the capacitors to previous settings: mine have scales ranging from 0 to 100.

Although polymer-film dielectric variable capacitors, such as the Mouser 24TR222, are suitable for use at broadcast-band frequencies, they are unacceptable for use at shortwave frequencies because the plates flex, changing the capacitance and making tuning erratic. I recommend using air-dielectric variable capacitors.

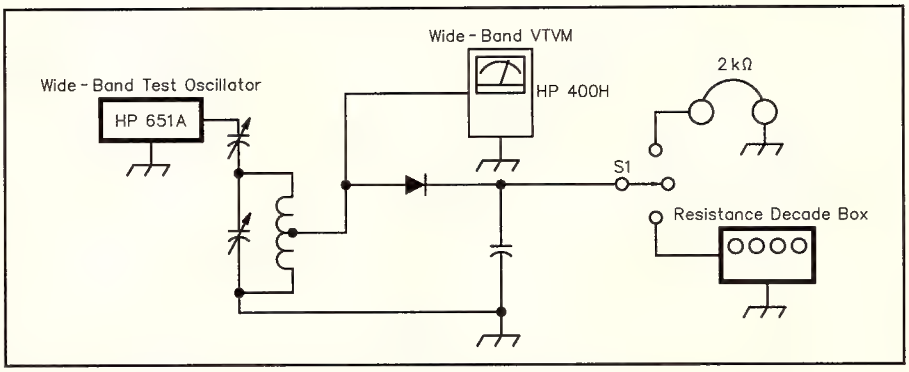

Figure 1—Crystal radio headphone impedance test configuration.

Author Dave Evison responds:

I strongly take issue with Charles' comments that builders of the crystal radio will be "discouraged by such a radio's poor selectivity." Although the crystal radio described in the article was purposely kept as simple as possible, it does deliver good performance in terms of volume and selectivity.

In response to the use of 37 Ω and 8 Ω headphones, I must confess I'm skeptical about using such headphones (unless an external matching transformer is used). Many crystal radio fans have successfully used audio output transformers to match 8 Ω speakers, and with good success. However, attempting to match 37 Ω or 8 Ω headphones directly by positioning the detector tap is something I have not tried, and I remain skeptical. Whether or not such matching can be efficiently accomplished is really a moot point. The article specifically states that the circuit is designed to accommodate customary 2 kΩ headphones. Figure 1 and the following description of laboratory measurements are from my design notes. All measurements were made with commercial laboratory equipment calibrated to factory specifications.

The purpose of the test setup in Figure 1 is to determine the position of the detector tap to match common 2 kΩ headphones. With S1 set at its center position, the HP 651 Wide-Band Oscillator is set to 1.0 MHz and the crystal radio tuned to resonance at 1.0 MHz as indicated by a peak reading on the HP 400H Wide-Band VTVM. I established a 0 dB reference (0.707 V RMS) on the VTVM by adjusting the output level of the '651 oscillator. Next, I moved S1 to place the headphones in the circuit and noted the voltage drop indicated by the VTVM. I then adjusted the tap position on the tank circuit until the VTVM indicated – 6.0 dB with the headphones in the circuit. At this point, the headphones are matched to the tap. To determine precisely what load impedance the headphones present, I set S1 to insert the resistance decade box as a load. The decade box controls were adjusted until a – 6 dB level was indicated by the VTVM. The decade resistor setting now indicates the substituted impedance that equals the load presented by the 2 kΩ headphones. In my test, the indicated impedance was 3 kΩ. I suspect there have been very few crystal radios designed with such attention to precision!

The bantering between Charles and myself is completely within the tradition of our wonderful hobby, and I appreciate Charles taking the time to state his opinion and findings.—*Dave Evison, W7DE, 153 Park Ave, Palo Alto, CA 94306, e-mail* **w7de@aol.com**

TRYING TO KILL A "BIRDIE"

By Charles R. Lackey, W4QBE, HC10 Box 567, Lakemont, GA 30552

◊ About five years ago, I bought a "boat anchor" RME 4350 receiver at a hamfest for $25. The receiver went on the shelf to be aligned and reconditioned when I had the time. Now that I'm retired—and when I'm not doing "honey dos"—I spend my time "messing" (according to my wife) with ham radio.

One of my projects was to successfully align the RME 4350 and begin using it on 160 meters. All was rosy except when DXing about 1830 kHz. There I could hear a raspy noise that repeated itself every 54.5 kHz. Using other boat anchors, I traced the signal to its second harmonic at 109 kHz. I could hear the birdies as high as 30 MHz at a reduced level. After considerable hunting—and blaming everything from the utility company to government VLF transmitters—I traced the signal to my 18 inch-dish-equipped satellite receiver which was turned off. At that point, I told my wife I'd finally found the source of the trouble and it would be downhill from now on—a foolish assumption.

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[1] Marv Gonsior, W6FR, "MikeMaster—A Microphone Preamplifier with Noise Gating and Compression," *QST*, Mar 1998, pp 33-36.

[2] Dave Evison, W7DE, "The Crystal Radio," *QST*, Dec 1997, pp 56-57.

I removed all the cables (except for the power cord) from the receiver; no help. Next, because the power cord is not equipped with a safety ground, I grounded the chassis. That resulted in a slight decrease in the 54.5 kHz signal level. I then wrapped the receiver's power cord around a 1/2 inch diameter, – 43 mix ferrite rod; no help. I tried a Corcom 10 ESK1 EMI filter; no help. A 1:1 isolation transformer; no help. A 54.5 kHz trap across the ac line; no help. After more head scratching, I moved the satellite receiver to other locations in the house with only the power cord attached. From all the locations and ac line receptacles, I got the same results—except when powering the receiver from the ac receptacles on my workbench. More head scratching. Could the ac line length be affecting the radiation from the satellite receiver?

I reinstalled the satellite receiver at its normal location, but this time fed the receiver through a 100-foot-long coiled extension cord: The 54.5 kHz noise dropped 5 dB! After coiling the extension cord around a 14 inch long by 1 inch square steel bar, the signal level was reduced by 7 dB. Although the 54.5 kHz birdie isn't entirely gone, it is reduced enough for me to now hear DX on 1830 kHz. A 100-foot extension cord and a piece of scrap steel solved my problem.

One lesson I learned from this interference chase is: Don't ever give up!

MFJ-1026 HELPER

By Mike Flicinski, K2UXE, 130 Jackrabbit Run, Round Rock, TX 78664; e-mail **k2uxe@ibm.net**

◊ I read the MFJ-1026 Deluxe Noise Canceling Signal Enhancer review[3] with considerable interest as I had purchased an MFJ-1026 several months earlier to deal with a very high line noise at my location.

I'll add emphasis to Paul Danzer's review by stating that if you're experiencing receiving difficulties because of local power-line noise, the improvement resulting from the use of the MFJ-1026 can be significant.

I was plagued with a power-line noise problem that resulted in a constant buzzing noise registering more than 20 dB over S9 on 80 meters; it was somewhat less on 40 meters. I found that by using a vertical antenna (a ground-mounted 4BTV) as a noise antenna along with my inverted **V** main antenna, I was able to reduce the noise to an S4-S5 base level! This was indeed significant, and enabled me to join the boat-anchor gang on 3.579 MHz using a receiver not equipped with a noise blanker. Even when using modern gear with noise blanking, I find that the resulting selectivity degradation with the noise blanker operating in a high-noise environment makes copy unpleasant. CW signals have "hash" on the tone because of the high noise level. Canceling noise *before* the receiver input is significantly better, a point MFJ makes in its literature. Similar results were obtained on 40 meters.

I found that even though the MFJ-1026 is indeed capable of many interesting signal manipulations as pointed out well by Paul, the unit is worth its cost (to me) to solve the line-noise problem alone!

Working with my local power company, the power-line noise problem was eventually fixed, but in the interim months, the MFJ-1026 made 80 meters completely usable, even with QRP stations. Now to explore its other capabilities!

Letters for this column may be sent to Technical Correspondence, ARRL, 225 Main St, Newington, CT 06111, or via e-mail to **ppagel@arrl.org.** Please include your name, call sign, complete mailing address, daytime telephone number and e-mail address on all correspondence. Whether praising or criticizing a work, please send the author(s) a copy of your comments. The publishers of *QST* assume no responsibility for statements made herein by correspondents.

New Books

SHORTWAVE RECEIVERS PAST & PRESENT—COMMUNICATIONS RECEIVERS 1942-1997 (3RD ED)

Edited by Fred Osterman, N8EKU

Published by Universal Radio Research, 6830 Americana Pkwy, Reynoldsburg, OH 43068. 1998. Third edition. Soft cover, 8½×11 inches, B&W photos, 473 pages, with model index, ISBN 1 882123 07 7, $24.95. Available from the publisher, 800-431-3939.

Reviewed by Rick Lindquist, N1RL
Senior Assistant Technical Editor

Wow! Talk about a vintage ham radio gear collector's dream come true. The first thing I did when I got my hands on *Shortwave Receivers Past & Present* was to look up all the receivers I ever owned or used over the past 40 years of hamming. My tour began with the Hallicrafters S-20R I'd purchased back in 1958. I recall paying $45.

And that brings me straight to one of the most terrific features of this book—the price guide. Other receiver compilations have avoided including any guidance as to current value. It was interesting to learn that an S-20R, which cost $50 to $60 new in the World War II era, can go for as much as $125 today. But a caveat: Putting a price tag on used gear can be a tricky business, since there are no hard-and-fast rules. In practical terms, any piece of gear is worth whatever a buyer is willing to pay. But as an occasional collector and veteran observer, I found the prices for items I was familiar with to be pretty realistic.

There is more than just price information in this hefty tome. Receivers are organized by manufacturer—from Allied to Yaesu. Each set of listings begins with a little writeup about each manufacturer. Each listing (a half page apiece) includes a high-quality black-and-white photo plus a wealth of information, including tube lineups (if appropriate), features, manufacturer's specifications, accessories, size and weight, the type of readout, and much more. *Shortwave Receivers Past & Present* even indicates the relative rarity of a given receiver (the S-20R is considered "common") and provides references to published reviews (including *QST*, of course).

Universal's flyer for this book claims it will make you an instant expert. I considered that as just so much ad hype until a friend of mine told me he was awaiting delivery of a Heath SB-301 and an SB-303 he'd purchased through a Web auction site. I was able to flip open *Shortwave Receivers Past & Present* (we were chatting on CW and he was running a crystal-controlled DX-20) and note that the former receiver was a tube set while the latter was solid state, and that they straddle the 1970 era.

What's rare? Well, this book includes sets by manufacturers many readers, and even collectors, may never have heard of. A few are pretty obscure. How about the Japanese manufacturer Anritsu?

One of my past sets now is considered "scarce," the Gonset G-63. It was only produced for two years, 1960 and 1961, and it was not a big hit (I recall that mine had a dial marking error on the 40-meter band). Many hams familiar with the Globe name (remember WRL?) probably didn't realize the company produced one receiver—a kind of S-38E knockoff called the Globe 'ceiver. It's deemed "very scarce" today. My Elmer, Frank, W2MMT, once let me borrow his beloved Howard 430 (we have one in the HQ museum). This compact six-tuber from the late 1930s is also on the "very scarce" list today, but I'd bet Frank still owns his.

The book includes models still in production, too, so it's useful for searching the used market for newer receivers.

Beyond the receiver information, this book discusses how to find and buy a used receiver, Web sites, restoration and repair resources and even a page of "Receivers that Never Were"—a grouping of prototypes that never got to market, such as the Hallicrafters SX-46 and the Hammarlund HQ-225. The chapter "Briefly Mentioned" covers (among other categories) extremely rare receivers or units for which sufficient information was unavailable.

It's difficult to evaluate the accuracy of the information this book provides. While most listings appeared accurate and complete, I spotted a few relatively minor goofs. For example, the Howard 430 does not have an S meter as the book states, and the Gonset G-63 did not have a built-in speaker. There may be others, but if they're no worse than these, they don't constitute a serious problem.

Yes, *Shortwave Receivers Past & Present* is the ticket to a nostalgia trip for veteran hams, but it's arguably the best reference guide of its type for the collector community or for those shopping the used market for a later model too. Oh, that Knight Space Spanner? Hang onto it. It's still worth up to $50.

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[3] Paul Danzer, N1II, "MFJ-1026 Deluxe Noise Canceling Signal Enhancer," Product Review, *QST*, Apr 1998, pp 73-74.

Happenings

Edited by **Rick Lindquist, N1RL** • Senior Assistant Technical Editor

Ham Radio's Friend in Congress:
Senator Barry Goldwater, K7UGA, SK

Former US Senator, onetime presidential candidate, and noted radio amateur Barry Goldwater, K7UGA, died May 29. He was 89. Goldwater had suffered a stroke in 1996 and had been in failing health.

A staunch conservative, Goldwater was the 1964 Republican presidential nominee and served five terms in the US Senate. He also authored the book *Conscience of a Conservative*. Goldwater retired from politics in 1986. His home was in Paradise Valley, Arizona.

As a Senator, Goldwater's legacy included several pieces of Amateur Radio-related legislation. In 1964, Goldwater's bill to allow reciprocal operating agreements between the US and other countries was signed into law. It was his work on the bill that prompted the Arizona Senator to renew his own interest in ham radio.

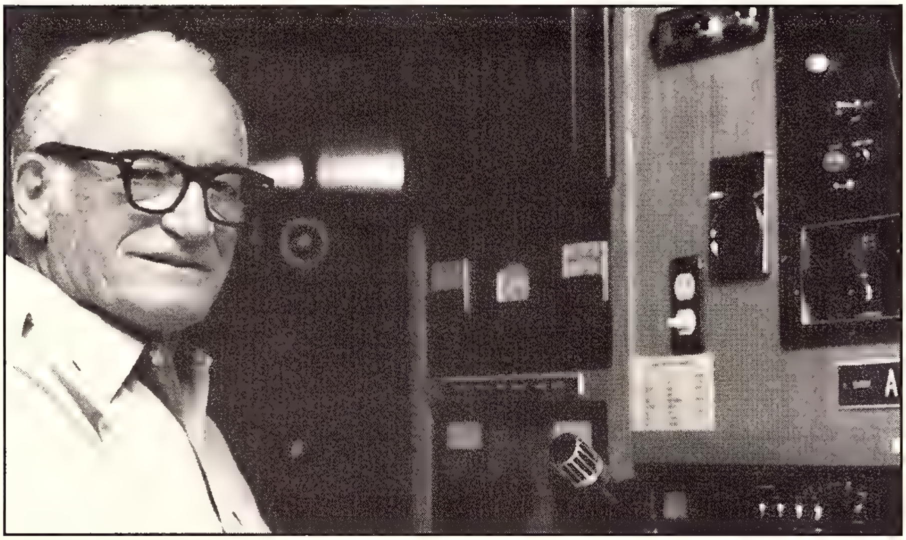
Goldwater took time from the 1964 campaign to address the ARRL National Convention in New York City on the occasion of the League's 50th anniversary. In his remarks, Goldwater reminisced about his youthful foray into Amateur Radio as 6BPI. He was first licensed in 1921, and joined the ARRL in 1923. "You can't imagine what a relaxation ham radio is for me," the campaign-weary Goldwater told the gathering. He related how, during the GOP Convention earlier that summer, he'd made several hundred contacts from his hotel room using a borrowed Collins S-line (see *QST*, Oct 1964, p 80). Goldwater lost the 1964 election to Lyndon Johnson.

In 1982, Congress finally approved and President Reagan signed what came to be known as the Goldwater Amateur Radio legislation, enacted as Public Law 97-259. The landmark measure established the Amateur Auxiliary and the volunteer examination programs, permitted 10-year license terms, and exempted Amateur Radio from the secrecy provisions of the Communications Act. The Goldwater bill also ended years of Congressional wrangling and authorized the FCC to set RFI susceptibility standards for home electronic devices.

A year later, President Reagan signed into law a bill that included a Goldwater amendment allowing the recovery of costs in the Volunteer Examiner program.

At one point in his ham radio career, Goldwater operated as K3UIG from his Senate office and as K7UGA when he was home in Arizona. He called his Arizona ham shack *bash-hal-ne-ae*, Navajo for "music from iron" or "metal that talks."

Goldwater was a life member of the ARRL. He was elected president of the Quarter Century Wireless Association in 1971. A pilot during World War II, he held the rank of Major General in the Air Force Reserve and was an active member of Air Force MARS. During the Vietnam War era, Goldwater established a team of volunteer operators at his AFA7UGA MARS station that handled hundreds of thousands of phone patches and messages between overseas service personnel and their families. He also held a pilot's license and occasionally operated aeronautical mobile.



ARRL Executive Vice President David Sumner, K1ZZ, called Goldwater "without peer among amateurs in the public sector" (see "It Seems to Us," on page 9 of this issue). Southwestern Division Director Fried Heyn, WA6WZO, called Goldwater "a super ham" who was "concerned about the future of Amateur Radio."

Goldwater's first wife, Peggy, died in 1985. The couple's two sons and two daughters and Goldwater's second wife, Susan, are among his survivors. For another perspective on Goldwater, see "Thanks, Barry" on page 50 of this issue.

MANY COMMENT ON LMCC PETITION

Hundreds of formal comments were filed in the wake of the Land Mobile Communications Council's rulemaking petition (RM-9267) seeking primary access to 420 to 430 MHz and 440 to 450 MHz for the Private Mobile Radio Service (PMRS) at the expense of the federal government. The petition also seeks other UHF spectrum.

In its comments, the ARRL asked the FCC to immediately dismiss the petition. The League said existing federal government use of the spectrum precludes PMRS operation at 420 to 450 MHz. It also said the petition failed to demonstrate any basis to withdraw the two segments from federal use, nor any compatibility between PMRS and either federal or amateur use.

The League and other formal commenters also cited the hobby's public service benefits during emergencies and disasters. AMSAT-NA President Bill Tynan, W3XO, pointed out that the International Space Station is expected to make "heavy use" of the band for Amateur Radio, an official ISS payload.

But it was the National Telecommunications and Information Administration that spoke the loudest in favor of retaining the current federal-amateur sharing arrangement on 70 cm. The NTIA, which manages federal spectrum, said it supports amateur operation at 70 cm and other bands "as an important adjunct to the National

Communications System and the National Weather Service, and with general recognition of the valuable public service performed." Amateur operations "share well" with military radiolocation radars because hams can tolerate the restrictions involved. The NTIA's bottom line was that "critical Federal operations in the 420-450 MHz band" make it inappropriate to consider reallocation. The NTIA also noted that Wind Profiler Radar operations at 448 to 450 MHz—which the LMCC had suggested be "discouraged"—are operational, not experimental. The NTIA said plans for an extensive WPR network at 449 MHz were proceeding.

Federal agencies ranging from USDA, the National Weather Service, the Department of Defense, and NASA, also weighed in. All opposed reallocation. Some, such as the NWS, specifically cited the value of Amateur Radio public service and the network of 150,000 weather spotters on call for emergencies. The Department of Defense said that interference from its radars and communication activities would preclude sharing with PMRS.

Several commenters were altogether silent on amateur issues. A few challenged the FCC to address the larger issue of private wireless spectrum allocation policy. Some organizations indicated wholehearted support for the LMCC petition.

The June 8 issue of *Wireless Week* reports that hams "flooded the FCC with letters" opposing RM-9267, "often in vehement terms." The article, "Hams Oppose Spectrum Sharing," by Caron Carlson, says that hams "warned the FCC that any further loss of their spectrum would be debilitating to the services they provide to the public free of charge," including help in natural disasters and emergencies. Carlson quoted as a typical comment one from John Kovac, K0VAC. "The reallocation of these frequencies would be a disaster in its own right," Kovac told the FCC.

In a related matter, the American Automobile Association conceded that it got incorrect information from the LMCC about how amateur frequencies came to be identified as targets for reallocation. AAA had told some correspondents that the Spectrum Planning and Policy Advisory Committee (SPAC) worked with the NTIA to identify 70 cm for reallocation. "We now know that was incorrect and that it was the LMCC that initiated the plan without support from either SPAC or NTIA," the AAA's Gary Ruark said in response to a letter from ARRL Executive Vice President David Sumner, K1ZZ, a SPAC member. Ruark said AAA's future correspondence would "reflect the correct information."

NEXT WRC TO BE IN 2000

The next World Radiocommunication Conference—until now referred to as WRC-99—actually will take place in 2000. The ITU Council decided the question when it met May 20-29 in Geneva. WRC-2000 is set to be held in the spring of that year in Istanbul, Turkey. The agenda and final schedule still are subject to confirmation. Since 1993, the worldwide conferences have taken place every two years. However, this time, members of the international community felt they needed more time to prepare. The change also means the following WRC won't happen until at least 2002.

Still expected to be lurking in the wings at WRC-2000 and hoping for an allocation of additional spectrum will be the low-Earth orbiting satellite industry, the infamous "Little LEOs." The industry seeks an additional 7 to 10 MHz of spectrum below 1 GHz.

Another potentially hot ham radio topic at the next WRC is a technology called

PHASE 3D WON'T FLY THIS YEAR

Phase 3D will not fly this year. AMSAT says the Phase 3D Amateur Radio satellite will not be aboard when the Ariane 503 launch vehicle goes into space this October. In addition to the Atmospheric Reentry Demonstrator, the European Space Agency says it will launch a dummy Eutelsat payload instead of Phase 3D .

In a surprise move earlier this year, Arianespace, a commercial company that markets Ariane launches, agreed to cover $40 million in Ariane 5 development costs resulting from the failure of the Ariane 501 test launch. In return, Arianespace asked to be allowed to pick the secondary payload for Ariane 503, the last in the Ariane 5 of qualification series.

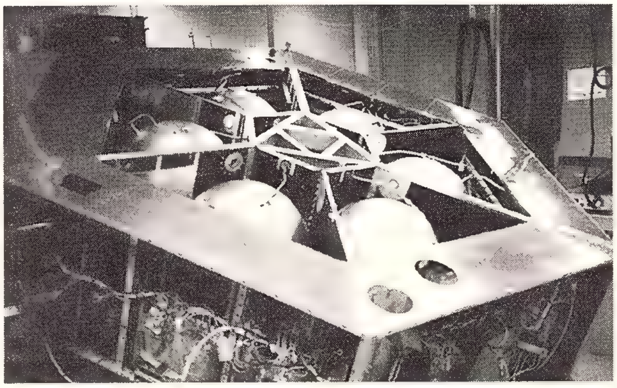
AMSAT-DL President Karl Meinzer, DJ4ZC, says it's clear to him that Arianespace wants to retain the option of swapping a real Eutelsat payload for the dummy right before launch. "We simply could not compete with this by our offer of $1 million and some moral justification of not flying ballast," he said. "So we wept some, and, that done, let us now look forward."

"This is obviously very disappointing news," said AMSAT-NA President Bill Tynan, W3XO, who pledged to continue efforts to get the satellite tested and ready for launch.

Meinzer said he thinks the chances "are not bad" that Phase 3D will get aboard an Ariane 5 flight next year. He said Arianespace has put a $10 million price tag on a launch, a figure he called "clearly out of reach." But he also held out the hope that ESA would negotiate further and that the German government might be willing to help with funding.

The Ariane 503 announcement was the latest setback for Phase 3D. AMSAT has been trying to find a ride for Phase 3D for the past couple of years and, until now, had pinned its hopes on the Ariane program. AMSAT-NA Executive Vice President Keith Baker, KB1SF, said AMSAT continues to seek a suitable launch opportunity and now is looking at "other agencies" instead of limiting itself to Ariane. "We're standby passengers," Baker reminded hams. In the meantime, the satellite is undergoing integration and testing in Florida.

STEVE FORD, WB8IMY



All dressed up and no place to go. The Phase 3D satellite as it appeared earlier this year at the Orlando, Florida, Integration Lab. AMSAT now hopes for a flight in 1999.

Baker said it's too soon to tell how the latest turn of events will affect Phase 3D finances. AMSAT-NA was forced to restart its Phase 3D fundraising effort late last year after determining that it still needed at least another $270,000 to meet its share of the costs. More recently, AMSAT-NA offered hams—for a $25 minimum donation—the opportunity to fly their QSL cards aboard Phase 3D. QSL cards will be scanned and put on a CD-ROM aboard the satellite.

"fixed wireless access." FWA—sometimes called wireless local loop—uses radio instead of wires to connect user telephone or data equipment to an access point in the public switched telephone network. While FWA proponents don't have a specific agenda item for new allocations at WRC-2000, they are looking at the suitability of more than 100 frequency bands starting at 27 MHz and working up. Their list of "candidate bands" includes some amateur bands above 420 MHz.

An ITU task group has also been studying the topic of "unwanted emissions," which includes both spurious emissions and out-of-band (OOB) emissions. OOB emissions include splatter and key clicks. A plan to replace current spurious emission limits with more stringent standards was adopted at WRC-97 (see "WRC-97—An Amateur Radio Perspective," *QST*, Feb 1998, pp 33-34). Still under consideration are new spurious emission limits for spacecraft and mandatory OOB limits for all radio services.

WRC-2000 also will consider adding a space-to-space GPS allocation at 1215 to 1260 MHz. ARRL representatives are watching this item to make sure there is no loss of amateur access to the 1240 to 1260 MHz band.

One issue of concern to hams may be postponed to WRC-2002 or later. The Earth Exploration Satellite Service has been eyeing the 430 to 440 MHz band for use by synthetic aperture radars (SARs). Although technical studies continue, it appears that the ITU will not take up this issue at the next WRC.

NEW VANITY FEE SET

Effective September 14, 1998, the vanity call sign application fee will drop to $13 for the ten-year term, payable at the time of application for a new, renewed, or reinstated license. The current vanity call sign application fee is $50. Earlier this year, the FCC had proposed dropping the fee to $12.90. The actual fee was "rounded up," said Terry Johnson in the FCC's Office of Managing Director.

The FCC says it does not plan to refund the difference between the current fee and the new fee for applicants who submit applications before the new fee schedule goes into effect.

Dayton's 1998 Amateur of the Year is WB2FXN

Andrew J. "Andy" Feldman, WB2FXN, was honored as the Dayton Hamvention's 1998 Amateur of the Year. Feldman, of Coram, New York, was recognized "for prominent involvement in the initial growth and ongoing development of RACES and ARES." Active in public service since he was first licensed in 1962, Feldman has served as Suffolk County (New York) ARES District Emergency Coordinator and as Suffolk County's American Red Cross chapter disaster communications chairman. Earlier this year, he became an assistant director of communications, New York Wing, Civil Air Patrol. He's also an active SKYWARN member. Feldman was in the forefront of ham radio support activity following the TWA Flight 800 disaster in July 1996, and during an outbreak of fires on Long Island in the summer of 1995. He works at Brookhaven National Lab as a technical contract specialist. In his spare time, Feldman says he enjoys OSCAR and packet.

The Dayton Hamvention Technical Excellence Award winner was Bob Bruninga, WB4APR, the "father of APRS." Bruninga, of Glen Burnie, Maryland, was honored for his role in creating and developing the Automatic Packet Reporting System, which the Hamvention called "an internationally recognized achievement." Bruninga calls APRS "a 24-hour-a-day job." He says he gets around 200 e-mail messages a day relating to APRS, often with questions from users. "APRS has consumed me," he concedes. He also expressed appreciation to other APRS authors—the Sproul brothers, WU2Z and KB2ICI; Steve Dimse, K4HG; and Brent Hildebrand, KH2Z—"for making APRS possible on all computers," he said. Bruninga is a contract engineer at the US Naval Academy in Annapolis. He's also the ARRL Technical Coordinator for Maryland-DC.

The Dayton Hamvention Special Achievement Award went to ARRL Dakota Division Vice Director John B. "Jay" Bellows Jr, K0QB. An attorney, Bellows, of St Paul, Minnesota, was honored for his work promoting the limited federal preemption, PRB-1, which requires municipalities to reasonably accommodate Amateur Radio antenna requirements. In particular, Bellows gained exposure through his *pro bono* legal work in the *Pentel v Mendota Heights, Minnesota,* case (see *QST* Mar 1994, p 91), which reaffirmed the original intent of PRB-1 and imposed an affirmative obligation on the city to accommodate ham radio with the "minimum necessary regulation to accomplish its legitimate purposes."

All three awards were presented May 16 by the Dayton Amateur Radio Association at the Dayton Hamvention banquet. Award-winning country music singer Ronnie Milsap, WB4KCG, was the banquet speaker and entertainment.

FCC NIXES EDAP TECHNOMED WAIVER REQUEST

The FCC has turned down a waiver request from EDAP Technomed Inc to operate its Prostatron medical device at 1.296 GHz at emission levels that exceed those allowed under Part 18 of the Commission's rules. The Prostatron is used to treat benign enlargement of the prostate.

The FCC said that while it's "sensitive to the need to facilitate the availability of medical equipment and reduce costs," it turned down the waiver "because of the threat of interference to aviation and Amateur Radio services." The 1.24 to 1.3 GHz band is allocated to the federal radiolocation service on a primary basis and is used for air traffic control radars. Ham radio is a secondary user.

The FCC said that with proper shielding, the Prostatron can comply with the FCC's rules without a waiver.

HAMS WEATHER STORMS

Hams activated weather-spotter nets and provided emergency communication as several parts of the US found themselves the target of violent weather this spring. On May 30, a tornado wiped out the town of Spencer, South Dakota, killing six. South Dakota SEC Jerry Gathright, WN0Y, reports that one of those who died was the wife of one of Spencer's two hams, the Rev Ward Satterlee Sr, W0MON. Press reports say Gloria Satterlee, 70, died when the couple's house collapsed as they were headed for shelter in the basement. The tornado also demolished the Rev Satterlee's church. The town's other ham,

FCC SEQUENTIAL CALL SIGN UPDATE

The following is a list of FCC sequentially assigned call signs issued as of June 3, 1998. For more information about the sequential call sign system, see Fact Sheet PR5000 #206S.

District	*Group A Extra*	*Group B Advanced*	*Group C Tech/Gen*	*Group D Novice*
0	AB0HQ	KI0NH	++	KC0DQD
1	AA1TR	KE1JU	++	KB1CWV
2	AB2FJ	KG2OL	++	KC2DRC
3	AA3RD	KF3BR	++	KB3CRI
4	AF4KF	KU4SO	++	KF4YRX
5	AC5QG	KM5QS	++	KD5EJW
6	AD6FK	KQ6WK	++	KF6RFW
7	AB7YD	KK7NZ	++	KD7BZX
8	AB8CS	KI8FZ	++	KC8KHX
9	AA9WD	KG9NS	++	KB9SYK
N. Mariana Island	NH0E	AH0AY	KH0GY	WH0ABJ
Guam	++	AH2DH	KH2TK	WH2ANW
Hawaii	NH7H	AH6PK	KH7JZ	WH6DEO
American Samoa	AH8R	AH8AH	KH8DM	WH8ABF
Alaska	AL0L	AL7RD	KL0OQ	WL7CUU
Virgin Islands	++	KP2CN	NP2KD	WP2AIJ
Puerto Rico	NP3W	KP3BG	NP3WP	WP4NNT

++All call signs in this group have been issued in this district.

Leslie Zeller, N3SMR, also lost his home, and his son was injured. Ironically, the Zeller family moved to Spencer after losing their home in Pennsylvania to a flood.

Tornadoes, severe thunderstorms, hail, flooding, and power outages also hit several areas of the Eastern US. Five people died May 30 and June 1 when deadly storms swept through Pennsylvania, New York, Vermont and Massachusetts.

On June 2, tornadoes struck in Pennsylvania and Maryland. The Pennsylvania twister killed two people and injured several others. At one point, a funnel cloud passed within view of Pittsburgh's Three Rivers Stadium as baseball fans waited for the game between the Pirates and the Mets to resume following a rain delay.

In New York on May 30, golf ball-sized hail pelted Saratoga, but Mechanicville and Stillwater in Saratoga County—just north of the capital of Albany—were the most severely damaged. An F3 twister, with winds estimated in excess of 200 MPH, cut a swath up to a half-mile wide, damaging or destroying more than 75 homes and businesses. As bad weather approached, the Troy Amateur Radio Association conducted SKYWARN nets on 2 meters and 70 cm. In the storm's wake, emergency nets continued, and hams staffed Red Cross shelters and assisted with damage assessment.

SKYWARN nets took to the air in New England as well. Some funnel clouds, hail and wind damage were reported in Massachusetts. Two men died in Massachusetts when a tree fell onto the vehicle they were in.—*thanks to Rob Leiden, KR2L; Fred Lehmann, WA0PBL; The Hudson Loop; and April Stack, K2ZCZ*

ANDY THOMAS BIDS *MIR* FAREWELL

US astronaut Andy Thomas, KD5CHF, said good-bye to *Mir* June 8 as he left for home aboard the shuttle *Discovery* after 130 days in space. Thomas, the last US astronaut scheduled to serve aboard *Mir*, said he found his return to Earth's gravity June 12 to be a "bizarre experience."

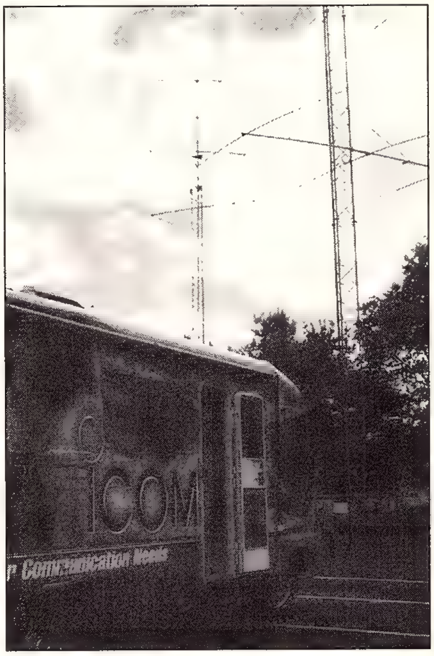
Before he left the aging Russian space outpost, Thomas broadcast a general "thank you" to the worldwide amateur community via the R0MIR packet system.

A special arrangement linking Thomas with several schools and individuals via telephone and Amateur Radio capped a series of highly successful *Mir*-school Amateur Radio contacts. The historic, early-morning QSO May 29 marked the last ham radio contact between earthbound students and a US astronaut aboard *Mir*. The contact was coordinated by the Space Amateur Radio EXperiment, or SAREX. ARRL SAREX representative Rosalie White, WA1STO, also got to take part in her first SAREX QSO, after years backstage arranging contacts.

On June 5, the day after *Discovery* docked with *Mir*, Thomas engaged in a last-minute flurry of random Amateur Radio contacts on 2-meter FM simplex. Among them was one with fellow Australian Peter Ellis, VK1KEP, who found himself thrust into celebrity status as a result. Thomas, who also holds the call sign VK5MIR, told Ellis that he was the first VK1 he'd ever worked. Trying for some local publicity for Amateur Radio, Ellis notified the local media, and soon wound up in the midst of a media frenzy—on local and national radio plus the front page of the *Canberra Times*, and on TV in Canberra and Sydney. During his *Mir* stay, Thomas spoke frequently with his family via Amateur Radio.—*thanks to Tony Hutchison, VK5ZAI, and QNews*

ICOM Funmobile visits HQ

ARRL staffers Peter Budnik, KB1HY (left), and Martin Cook, N1FOC (right) check out the HF gear inside the ICOM Funmobile. The 30-foot motor home packed with ICOM amateur, marine, SWL, and Family Radio Service gear, visited ARRL HQ on June 3 and parked in the shadow of the W1AW antennas. The equipment complement features a working Amateur Radio station with an IC-775DSP, an IC-746 and an IC-756. Retired ICOM America Amateur Division Manager Chuck Northcutt, W7SRZ, was at the wheel for this leg of the trip. Including a stop at the Dayton Hamvention, the Funmobile has visited nearly half the states and a couple of Canadian provinces. More photos of the Funmobile's HQ visit are at **http://www.icomamerica.com/ontheroad/photos/arrl.html**.



DOUG SMITH, KF6DX, NAMED *QEX* EDITOR

Doug Smith, KF6DX, the Chief Engineer at Kachina, will take over the editorial reins of *QEX*—the ARRL Forum For Communications Experimenters—beginning with the September issue. Current *QEX* editor, Rudy Severns, N6LF, is stepping down to devote more time to his business and family. Severns is moving and will take on duties as an adjunct faculty member at Oregon State University in Corvallis, where he'll teach power electronics.

Smith, 40, has spent the past 20 years involved in HF SSB, with a particular emphasis on control systems. He's been with Kachina for five years and was instrumental in the development of the company's PC-controlled 505DSP HF transceiver, which debuted at the 1997 Dayton Hamvention. Smith will continue at Kachina.

While DSP has been the focus of the past few years of his career, Smith says he enjoys "all aspects of RF engineering." Originally from San Diego, California, Smith was licensed in 1982. He attended Cal Tech and now lives in Sedona, Arizona. Under his leadership, he said, *QEX* will remain "the mouthpiece of front-level experimentation in Amateur Radio" and will embrace new technologies, while still appealing to a broad readership.

Smith also says he'll be on the lookout for new material. "We're always looking for good, analytical articles," he said. It was Smith's own *QEX* series on DSP, "Signals, Samples, and Stuff—a DSP Tutorial," that brought him to the attention of ARRL Publications Manager Mark Wilson, K1RO, and *QEX* Managing Editor Bob Schetgen, KU7G. Smith predicts that DSP will play a big role in the future of communication.

"A lot of hams out there are experimenters," he said, adding that he'd like some of them to consider publishing their projects in *QEX*. "There are hams out there building a lot of very good equipment, and not all of them are writing about it."

RICK LINDQUIST, N1RL

Incoming *QEX* Editor Doug Smith, KF6DX (center), meets with outgoing *QEX* editor Rudy Severns, N6LF (right), and *QEX* Managing Editor Bob Schetgen, KU7G (left), at ARRL HQ.

In Brief

- **Job opening at HQ:** There's a job opening at ARRL Headquarters in Newington, Connecticut, for an Assistant Contest Manager to work with the Contest Manager in administering the ARRL Contest Program. Job-related qualifications include knowledge about, and interest in, the League's varied contest program. The candidate should be familiar with the *ARRL DXCC List*, ARRL sections and divisions, and current contesting issues. An Amateur Radio license, writing skills, PC familiarity, including DOS, *Windows*, e-mail, and database management skills are required. Accuracy is a must. Some travel and ability to speak in forums required. Beginning salary, $18,000 to 20,000, depending upon qualifications. Send resumes to Bill Kennamer, K5FUV, Membership Services, ARRL, 225 Main St, Newington CT 06111. No telephone calls, please. The ARRL is an Equal Opportunity Employer.
- **WB6BYU to lead US ARDF team:** Dale Hunt, WB6BYU, of Yamhill, Oregon, will lead the US fox-hunting team at the ninth World Championships of Amateur Radio Direction Finding (ARDF) this fall. The competition of radio orienteers will be held in Hungary during the first week of September. The US foray will mark this country's first effort at the World Championship of foxhunting. The aptly named Hunt, 45, is experienced in the sport of international-style foxhunting. He competed last year against Russian, Canadian, and Japanese hams at the Friendship Radiosport Games near Tokyo, Japan. Under WB6BYU's leadership, four other West Coast hams are expected to compete on Team USA. Team USA will be up against hundreds of the best foxhunters from more than two dozen European and Asian countries. For more information, contact ARRL ARDF Coordinator Joe Moell, KØOV, PO Box 2508, Fullerton, CA 92837; e-mail **homingin@aol.com**. Canadian amateurs may contact RAC National ARDF Coordinator Perry Creighton, VE7WWP, 4011 Hollyridge Pl, Victoria, BC V8N 5Z8. For more information about ARDF, see **http://members.aol.com/homingin/**.
- **FCC asks Germany to silence broadcaster:** Sometimes it helps to complain. The FCC's High Frequency Direction Finding Group has asked German authorities for their help in eliminating a broadcast station in Germany that's operating illegally on 3945 kHz. Members of the ARRL Monitoring System (MONSYS) and other US hams had complained to the FCC and to the ARRL about the station's presence. In Region 1, 3900 to 3950 kHz is authorized for aeronautical mobile operation, and 3950 to 4000 kHz is allocated to broadcasting. In the US, in Region 2, the band is allocated to amateur, fixed and mobile. The station on 3945 kHz, identified as The Overcomer Ministry, has been monitored at several East Coast locations as well as by the FCC.

Section Manager Election Notice

To all ARRL members in the Eastern Massachusetts, Northern New York, Missouri, Nebraska, New York-Long Island, South Carolina, Southern New Jersey and Western Pennsylvania sections. You are hereby solicited for nominating petitions pursuant to an election for section manager (SM). Incumbents are listed on page 12 of this issue.

To be valid, a petition must contain the signatures of five or more full ARRL members residing in the section concerned. Photocopied signatures are *not* acceptable. No petition is valid without at least five signatures, and it is advisable to have a few more than five signatures on each petition. Petition forms (FSD-129) are available on request from ARRL Headquarters but are not required. We suggest the following format:

(Place and Date)

Field Services Manager, ARRL
225 Main St
Newington, CT 06111

We, the undersigned full members of the ______ ARRL section of the ______ division, hereby nominate ______ as candidate for Section Manager for this section for the next two-year term of office.

(Signature____ Call Sign____ City___ ZIP____)

Any candidate for the office of Section Manager must be a resident of the section, a licensed amateur of Technician class or higher and a full member of the League for a continuous term of at least two years immediately preceding receipt of a petition for nomination. Petitions must be received at Headquarters by 4 PM Eastern Time on September 4, 1998. Whenever more than one member is nominated in a single section, ballots will be mailed from Headquarters on or before October 1, 1998, to full members of record as of September 4, 1998, which is the closing date for nominations. Returns will be counted November 24, 1998. Section managers elected as a result of the above procedure will take office January 1, 1999.

If only one valid petition is received from a section, that nominee shall be declared elected without opposition for a two-year term beginning January 1, 1999. If *no* petitions are received from a section by the specified closing date, such section will be resolicited in the in the January 1999 *QST*. A section manager elected through the resolicitation will serve a term of 18 months. Vacancies in any section manager's office between elections are filled by the Field Services Manager. You are urged to take the initiative and file a nomination petition immediately.—*Richard Palm, K1CE, Field Services Manager*

Nominees Sought for ARRL Board of Directors

If you're a full ARRL member in one of the following eight divisions and are interested in playing a part in the League's democratic organization, here's the opportunity. Nominations are open for the offices of director and vice director for the 1999-2000 term in the Central, Hudson, New England, Northwestern, and Roanoke divisions, and for the 1999-2001 term in the Rocky Mountain, Southwestern, and West Gulf divisions.

ARRL Divisions

The policies of the League are established by 15 directors who are elected to the Board on a geographical basis to represent their divisions and constituents (see page 10 of any recent *QST* for a list of the divisions, directors and vice directors). As we make a transition to three-year terms for all directors starting with elections in the year 2000, these 15 directors serve for two or three-year terms, with seven or eight standing for election in alternate years.

Just as in national or state politics, ARRL voters/members have the privilege and responsibility to decide that they like the actions of their incumbent representatives and support them actively for reelection or to decide that other representatives could do a better job, and to work for the election of those persons. Vice directors, who succeed to director in the event of a midterm vacancy and serve as director at any Board meeting the director is unable to attend, are elected at the same time.

Call for Nominations

Nominations are open for director and vice director in the Central, Hudson, New England, Northwestern, and Roanoke divisions for the two-year term beginning January 1, 1999. Nominations are open for director and vice director in the Rocky Mountain, Southwestern, and West Gulf divisions for the three-year term beginning January 1, 1999.

How to Nominate

1. *Obtain official nominating petition forms.* This package consists of a cover letter; a reprint of this election announcement; blank Official Nominating Petition forms and Candidate's Questionnaires for the offices of director and vice director; a copy of the ARRL Articles of Association and Bylaws; and an informational pamphlet for candidates.

Any full member residing in a division where there is an election may request an official nominating petition package. You don't need to be a candidate to request the forms. Your request for forms must be received by the Secretary *no later than noon Eastern Time on Friday, August 14.* There are separate forms for director and vice director nominations.

2. *Submit petition with statement of eligibility and willingness to serve.* Official forms bearing the *signatures of 10 full members of the division* and naming a full member of the division as a candidate for director or vice director, must be submitted, with a statement *signed by the candidate* attesting to his or her eligibility, willingness to run and willingness to assume the office if elected. These documents must be filed with the secretary *no later than noon Eastern Time on Friday, August 21, 1998.* Only *original* documents can be accepted; *no facsimiles of any kind are acceptable.* On Monday, August 24, 1998, the secretary will notify each candidate of the names and call signs of each other candidate for the same office. Candidates will then have until Friday, September 4, 1998, to submit 300-word statements and photographs, if they desire these to accompany the ballot, in accordance with instructions that will be supplied.

3. *Election Committee to certify eligibility.* In accordance with the Bylaws, an Election Committee, composed of three directors not subject to election this year, is responsible for the conduct of the election. This year the Election Committee consists of Kay Craigie, WT3P (chair); Frank Butler, W4RH, and Tod Olson, K0TO.

The nominee must hold at least a Technician amateur license, be at least 21 years of age and have been licensed and a full member of the League for a continuous term of at least four years immediately preceding nomination. No person is eligible whose business connections are of such nature that he or she could gain financially through the shaping of the affairs of the League, by the Board or by the improper exploitation of his or her office for the furtherance of his or her own aims or those of his or her employer. The primary test of eligibility is the candidate's freedom from commercial or governmental connections of such nature that his or her influence in the affairs of the League could be used for his or her private benefit. The idea behind these rules is to ensure that candidates: (1) possess a lasting interest in Amateur Radio and the League, (2) have the legal capacity to make decisions for the ARRL and (3) are free from conflicts of interest.

Balloting Will Follow

If there is only one eligible candidate for an office, he or she will be declared elected by the Election Committee. Otherwise, ballots will be sent to all full members of the League in that division who are in good standing as of September 10, 1998. (You must be a licensed radio amateur to be a full member.) The ballots will be mailed not later than October 1, 1998 and to be valid, must be received at HQ by noon Eastern Time on Friday, November 20, 1998. A group of nominators can name a candidate for director or vice director, or both, but there are no "slates," as such. Each candidate appears on the ballot in alphabetical order. If a person is nominated for both director and vice director, the nomination for director will stand and that for vice director will be void. A person nominated for both offices does have the option, however, of declining the higher nomination and running for vice director if he or she wishes. Because all the powers of the director are transferred to the vice director in the event of the director's death, resignation, recall, removal outside the division or inability to serve, careful selection of candidates for vice director is just as important as for director.

Absentee Ballots

All ARRL members licensed by the FCC, but temporarily residing outside the US, are eligible for full membership. Members overseas who arrange to be listed as full members in an appropriate division prior to September 10, 1998, will be able to vote this year where elections are being held. Members with overseas military addresses should take special note of this provision; in the absence of information received to the contrary, ballots will be sent to them based on their postal addresses. Even within the US, full members temporarily living outside the ARRL division they consider home may have voting privileges by notifying the Secretary prior to September 10, 1998, giving their current *QST* address and the reason that another division is considered home. If your home is in the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern, or West Gulf division but your *QST* goes elsewhere, let the ARRL secretary know as soon as possible, but no later than September 10, so you can receive a ballot from your home division.

The Incumbents

These people presently hold the offices of director and vice director, respectively, in the divisions conducting elections this year:

Central—Edmond A. Metzger, W9PRN, and Howard S. Huntington, K9KM

Hudson—Frank Fallon, N2FF, and J. P. Kleinhaus, W2XX

New England—Tom Frenaye, K1KI, and Michael N. Raisbeck, K1TWF

Northwestern—Mary Lou Brown, NM7N, and Greg Milnes, W7AGQ

Roanoke—John C. Kanode, N4MM, and Dennis Bodson, W4PWF

Rocky Mountain—Marshall Quiat, AG0X, and Walt Stinson, W0CP

Southwestern—Fried Heyn, WA6WZO, and Art Goddard, W6XD

West Gulf—Jim Haynie, W5JBP, and Barney Boone, KJ5AE

For the Board of Directors:
May 15, 1998
David Sumner, K1ZZ
Secretary

How's DX?

Edited by ***Bill Kennamer, K5FUV*** *• DXCC Manager*

New Ones under the New Rules?

Kan Mizoguchi, JA1BK, operates as FO0MIZ from the Austral Islands in April 1998.

JA1BK

The FO0MIZ QTH on the Marquesas. Note the dipole antenna, which provided 2500 QSOs during two days of operation.

JA1BK

Since the implementation of the DXCC rule changes, based on the work of the DXCC2000 Committee, there's been a little excitement on the bands over some possible "new ones" inspired by these changes. Here's how the rules changes affected these possible new entities, and how they are different from the past.

First active was the Temotu Province of the Solomon Islands, H40. Operations included H40AA, by the South China Sea DX Team in cooperation with the Solomon Islands Radio Society, and H40AB by Jim Smith, VK9NS. If you check your *National Geographic Atlas of the World*, you'll find the Temotu Province east of San Cristobal Island. The most westerly, and largest, island of the group is Nendo. Also included in this province are the Reef and Duff Islands.

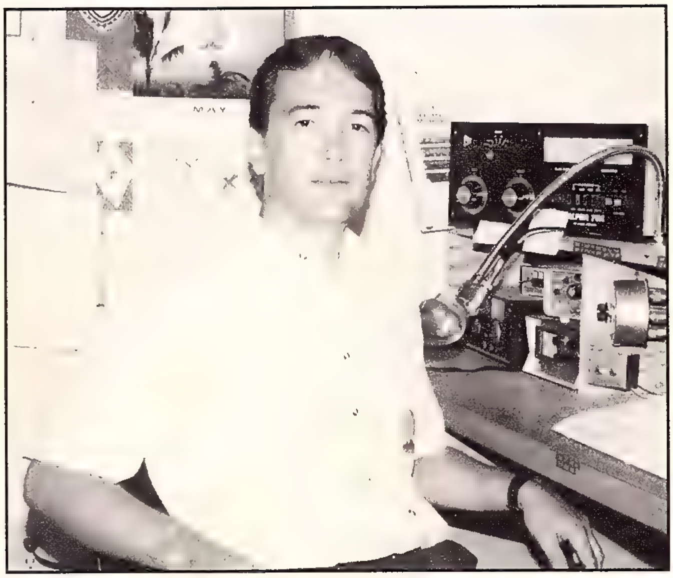
Under the old rules, a 225-mile separation by water was required in order to be considered for a place on the DXCC List. The new Criteria (since March 31, 1998) changed the distance requirement to 350 kilometers. This was a change of about seven miles, made to make the measurements fall into an even increment of 50 or 100 kilometers. Nendo is over 350 kilometers from Santa Ana Island, located at the tip of San Cristobal. Under the old rules, it was believed to be less than one mile short of the required distance. However, charts indicate that the islands are reported to be two to three miles east (and further from Santa Ana) than shown. Thus, the petition was filed under criteria paragraph 2 (b) (i), where the Solomon Islands are the "Parent" because they are a UN member state, an ITU member, have an IARU society and because Temotu Province is separated by water by a distance of at least 350 kilometers.

The Austral Islands and the Marquesas Islands of French Polynesia have also been active since the effective date of the new criteria. FO0MIZ, by JA1BK, and FO0FI and FO0FR by W6RJ and W6KR were both active in April. FO0PAP and FO0MAC, by K8YSE and W8JGU, were on in June.

Both of these islands have been considered before. Both are more than 350 kilometers from the main islands of French Polynesia, and more than 800 kilometers from each other. After the rules change in 1988, islands removed from the main island group by this distance could be considered if they were part of a DXCC entity as defined under Point 1 (government). The Point 1 criteria included Territories, Dependencies, Associated States, and Protectorates—*if they had a sovereign status.* However, by definition, it would be impossible for any of those types of entities to demonstrate sovereignty. Even so, there was a precedent in the DXCC program for territories being added to the list even though separation did not exist. Old-timers will remember French Equatorial Africa, Algeria, French Morocco, and French West Africa, among others, all

JA1BK

Kan stands between the antennas of FO0MIZ and FO0FI in the Australs.



Beginning next month Bernie McClenny, W3UR, will be the new editor of "How's DX?".

on the DXCC List, all French Territories, and *none* separated from another French territory that was also on the DXCC List.

Under the new criteria, those territories with IARU societies now qualify for the DXCC List as political entities. Only one IARU society may represent the amateurs of a country or separate territory. Thus, having an IARU society certainly satisfies the intent and history of the DXCC program. This means that French Polynesia, with the Club Oceanien de Radio et d'Astronomie (CORA), meets the criteria as a political entity under the new criteria, and can be a "Parent" for further subdivision. The only question then becomes one of distance, and both island groups appear to be far enough removed.

Goodbye ... and Hello!

This issue completes five full years of my tenure as editor of "How's DX?". It's been fun, but I have new responsibilities as ARRL Membership Services manager and they're placing enormous demands on my time. For you, it means a new call sign at the top of this column beginning with next month's issue. Bernie McClenny, W3UR (ex WB3JRU, WR3E) editor of *The Daily DX*, an Internet DX publication, has agreed to step into the role as your new "How's DX?" editor. Although a relative youngster, Bernie could be considered an old-timer as a DXer. Here's Bernie's story in his own words:

"The world of DX started for me before I was even licensed in early 1976. I can remember looking at a map full of pins on the wall in my Dad's ham shack marking locations of his contacts around the world. In the fall of 1977 with a Heathkit HW-101 and a two-element beam on top of the house my DX journey began. Every amateur can recall his or her first DX QSO, and at WB3JRU it was Dr. Ernst Kredel, KZ5EK, from the Canal Zone. After that first QSO the DX bug had set in. By the spring of 1980 a Novice DXCC was hanging on the wall. It was not the first, as Bill Tippett, W4ZV (ex KN4RID), did it in 1958, but it was mine.

"Contesting is one of my favorite ways to work DX. This quickly led me to join the Potomac Valley Radio Club, a premier contesting club in the Washington, DC area. In my mid-teenage years the contest bug bit hard, and I was able to spend some of my early years with veteran contesters Bob Cox, K3EST, and Phil Allardice, KT3Y (ex WB4SGV), at the QTH of Fred Laun, K3ZO. I also started a 15-year career with a local hardware company, again following my Dad's example.

"In the fall of 1984 I took a short term hiatus from Amateur Radio until the spring of 1986 when I purchased my first home, a townhouse located just outside of Columbia, Maryland. It wasn't long before I had my own station on the air using a vertical on a postage-stamp-size lot.

"After marrying Becky (now N3OSH) we moved to a new home in the western part of Howard County, Maryland, with a one-acre lot. Soon afterward a 70-foot tower was up with a TH7 beam and wires for the low bands. Many all-time new ones were worked and I was able to hit the Top of the Honor Roll while still in my late 20s. However, after our two children, Christa and Kyle, were born we realized it was time for a bigger house.

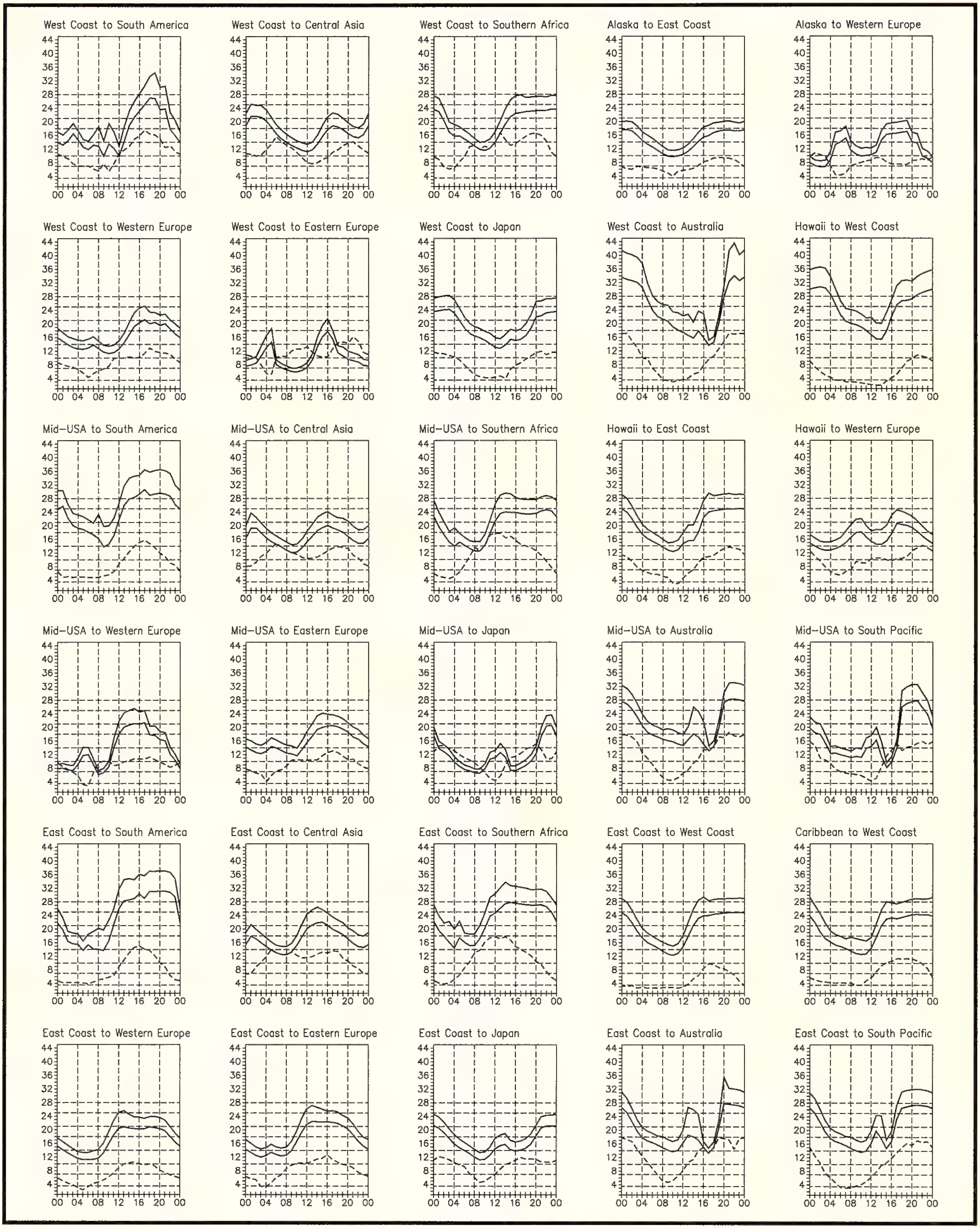
"It wasn't long before my friend Frank Donovan, W3LPL, called and said there was a home for sale next to his. Several weeks later we became neighbors. He was gracious enough to allow me to roll out and bury three runs, 700 feet each, of cable TV Hardline from my basement to his. This gives me access to some very serious antennas, except during the major contests, for all bands except 12, 17 and 30 meters for which I have my own. With the 10 acres of land that Frank has, and the additional three acres in my possession, we were able to install a 160-meter four-square vertical array.

"By the end of 1995 I finished my 15-year career in hardware. Rich Boyd, KE3Q, and I had been talking for several months about possible job opportunities and out of one of those conversations an idea came. In the spring of 1997 *The Daily DX* was launched as the first daily DX news service available by subscription and delivered by e-mail. Editing a daily DX bulletin (Monday-Friday) keeps me very busy and very informed on the DX world.

"Although I am not an old-timer, as many would think by the call sign, I have been DXing for over 20 years. I feel very privileged to have had some world-class operators as my teachers and role models: Fred, K3ZO; Frank, W3LPL; Bob, K3EST; Mike, K3HPG; and Phil, KT3Y; and others like Iris, W6QL; Lloyd, W6KG; Erik, SM0AGD; and Ron, ZL1AMO.

"The DX world is constantly changing whether it is the 'DXCC Entities,' players, propagation, or radios. My job will be to keep you informed and up to date on the DX world at large. Another of my duties will be to encourage you, the DXer, to be active on the air and chasing your DX goals. I invite your input. After all, it is really *your* column. See you in the pileups!–*Bernie McClenny, W3UR*"

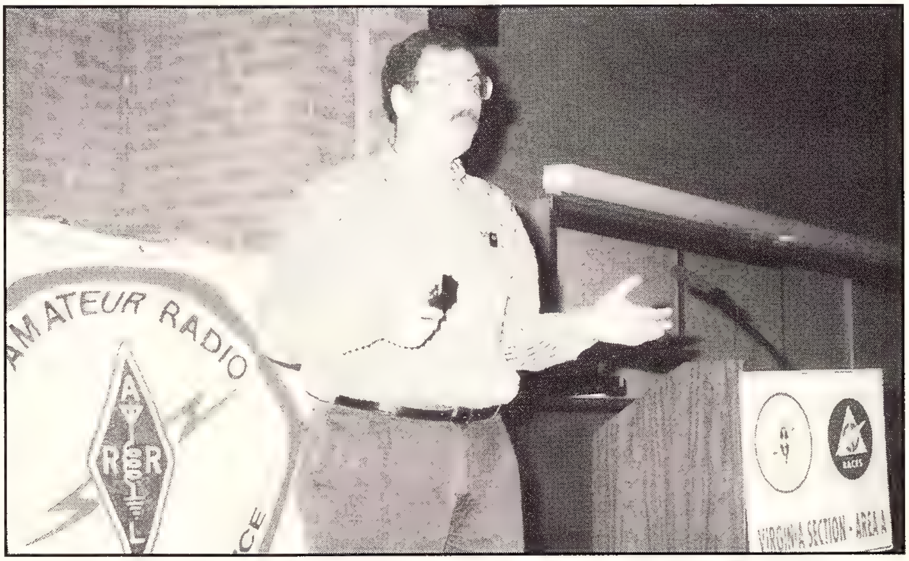
For future submissions to "How's DX?" send material directly to: Bernie McClenny, W3UR, 3025 Hobbs Rd, Glenwood, MD 21738-9728; fax 301-854-5105 or e-mail **bernie.mcclenny@mail.wdn.com**



When are the bands open? These charts, generated using IONCAP+ from CAPman, show probabilities for average HF propagation from August 16 to September 15, 1998, for the paths indicated. The horizontal axes show Coordinated Universal Time (UTC), and the vertical axes frequency in MHz. On 10% of the days of this period, the highest frequencies propagated will be at least as high as the upper curves, and on 50% of the days they will be at least as high as the lower solid-line curves. The broken lines show the lowest usable frequency (LUF) for a 1500-W CW transmitter. For SSB or a lower transmitter power, the LUF will be somewhat higher than the curves indicate. See October 1994 *QST*, pp 27-30, and February 1995 *QST*, pp 34-36, for more details. The predictions for this period assume an observed 2800-MHz solar flux value of 135.

How the Pieces Fit—A Virginia Public Service Workshop

By Martin Gary, W2MG
Assistant Emergency
CoordinatorHanover County ARES/
RACES
Public Information Coordinator,
Area "A" ARES/RACES



Bill Sammler, Warning Coordinator Meteorologist, National Weather Service Office, in Wakefield, Virginia, applauds Amateur Radio operators and their association with the SKYWARN program in Virginia and North Carolina.

On November 15, 1997, at John Tyler Community College, in Chesterfield, Virginia, federal and state officials addressed more than 100 state amateurs concerning operation of their agencies and the most effective use of amateur resources during emergencies. "This is the first time officials from the Federal Emergency Management Agency (FEMA), Virginia Department of Emergency Services (VDES), National Weather Service and local emergency management officials met to coordinate planning and implementation with the Amateur Radio community in Virginia," said Frank Mackey, K4EC, SEC and state RACES officer.

Tony Amato, KR4QU, Assistant SEC for Operations, set the tone when he commented, "Amateurs—forget the past and hear the experts explain how their agencies function *today*, for we *serve* government and their needs are paramount to ours. Agencies—make amateurs a part of your drills and SETs so they will be conversant with your operations, and when disaster strikes, we can work *seamlessly* with your organizations. All the paper pre-planning is of little value without regular, cooperative and interactive training. Each organization must know what the other needs and expects to make an effective team, which cannot happen without interactive drills."

ARES and RACES

Mackey explained that although many amateurs "come out of the woodwork" during a disaster, unless they have training it is difficult to put their resources to best use. "ARES provides a basis for training, organization, and has many formal Memoranda of Understanding (MOU) with served agencies," he said. In Virginia, 107 ECs serve 95 counties and 12 independent cities. They liaison with served agencies, conduct training, hold nets, and maintain rosters.

Mackey explained that RACES is sponsored by state or local governments and is supported by FEMA. It responds to the needs of governmental agencies and provides communications only when activated by their officials. Virginia does not have a group distinction between ARES and RACES, because a formal agreement between ARES and VDES designates all ARES members as RACES personnel when RACES is activated.

Citing amateurs' renowned flexibility and ingenuity, Mackey recalled one incident where EMS and Fire personnel could not contact hospitals 12 miles away. Both services could not get a signal out of the building. Amateurs could not either, but amateur ingenuity led to a solution: By using a dual-band H-T inside, hams were able to make a crossband connection to an amateur's mobile rig in the parking lot, which provided a link through a local repeater! The officials were impressed.

Digital Communications

Packet is a preferred mode in public service communication because of its accuracy and printed-record capability. While the Internet may be hot, it is not useful for tactical communications in the field. Citing packet's use in an annual Marine Corps Marathon, Mackey explained how packet was able to provide detailed information in real-time. The amateur packet system was also linked to a LAN serving Marine computers. A few amateurs were able to do what the Marines could not, even with all their resources!

MARS

While the Military Affiliate Radio Service (MARS) began in 1925 as a traffic handling operation for armed services members and their families, its role is evolving into an efficient HF network for backup emergency communications, according to Jack Cavanagh, KB4XF, the state's Army MARS Director. Air Force MARS Director Bill Conway, W8HNT, explained that each branch of MARS is here to support, not supplant ARES or RACES. Using non-amateur frequency allocations, each MARS service can provide additional backup. As their mission evolves, the three independent MARS branches will consolidate and work more closely together. MARS fits in the background to provide assistance for all levels from federal to local agencies as well as ARES and RACES.

Virginia Department of Emergency Services

Most states have an agency to coordinate emergency response among its localities. VDES has a communications center that serves 140 jurisdictions with a normal staff of 10 people. When an emergency occurs, the state EOC becomes the hub of state operations. When activated, its ranks swell with federal and state employees, along with volunteers to respond by phone and keyboard to receive incident reports and dispatch resources. Adjacent to the communications room is a fully equipped, three-position amateur station with HF and VHF voice and VHF packet gear. When the phones are overloaded or down, Amateur Radio is the backup. When needed, a statewide amateur network can be implemented. While Virginia officials have an excellent, state-of-the-art communications system, they are quick to recognize the system could fail, and rely on Amateur Radio for just such an event.

"Know the proper address," implored Henry Hassell, K4LMY, deputy state RACES officer. "All traffic must follow ARRL Radiogram procedures. Be sure that all messages are signed by a person who has the authority (local mayor, county administrator or other paid staff). Amateurs do not originate traffic from an EOC, unless specifically requested."

National Weather Service—SKYWARN

Participation in central and southeast Virginia and North Carolina SKYWARN programs is a huge success, according to Bill Sammler, Warning Coordinator Meteorologist, National Weather Service (NWS) office, in Wakefield, Virginia. In three years, Sammler noted a well-organized statewide network formed by amateurs to supplement his office's advanced Doppler radar. His efforts led to an operating position featuring two VHF/UHF radios, VHF packet, a radar display and EMWIN official warning printout. Since radar cannot give detailed local conditions below certain altitudes, amateurs provide critical and real-time information. SKYWARN training teaches amateurs how to report local conditions that contribute to NWS warnings.

Sammler recounted how local amateurs recently provided real-time reports of tornadoes that wreaked havoc in Norfolk, when NEXRAD had difficulty spotting the storms due to their tiny footprints. "Amateurs provided the first reports to the Weather Service of the small but dangerous tornadoes as each touched down, allowing warnings to be issued instantly to the public."

FEMA

When devastation transcends state and local capabilities, explained Paul Reid, N4EKW, State Director of Planning for FEMA, his agency takes charge. FEMA supports "state customers" and works down to local levels. The Stafford Act and agreements with 27 federal departments, agencies and the Red Cross provide FEMA with the authority to establish a Federal Coordinating Officer and a Disaster Field Office (DFO). The DFO has 12 emergency support functions (ESF) from transportation to food and energy. The DFO works through the state DOT, state police and the fire marshal, health departments, rescue services and volunteer disaster relief organizations.

Communications (ESF-2) is where Amateur Radio connects with FEMA. When using RACES, MARS and their MOU with the ARRL and Civil Air Patrol (CAP), FEMA normally has no direct interface. Amateurs are considered a state/local resource, while MARS and CAP are considered Department of Defense (DoD) resources. FEMA does not want to bypass state and local level agencies to recruit and train amateurs.

Reid explained, "FEMA will continue to support RACES for those states and local governments that want a separate program." The agency is working with the ARRL for FCC rule changes to expand training hours, allow RACES and non-RACES stations to communicate and to clarify authority for FEMA stations to communicate with amateurs during emergencies and tests.

Future Trends

The future will find more linking of repeaters statewide, coordination with MARS and the increased use of newer modes such as CLOVER, PACTOR II and APRS to expand capabilities. Additional formal training (regional seminars and workshops) in procedures and traffic handling will sharpen skills.

Central to each presentation was the need to communicate with and establish good working relationships with served agencies. DECs and ECs should make themselves known to local jurisdictions. Many communities are planning new facilities, updating plans or changing staff members. ECs should inform them of their capabilities.

Individual amateurs are encouraged to join local ARES/RACES groups to gain valuable training and experience *before* disaster strikes. The ability of Amateur Radio to respond to emergencies is one of our central privileges and responsibilities. Above all, Frank Mackey, K4EC, said, "all *amateur* means is you can't accept compensation for your services, but you must act *professionally* in your duties."

Resources

Visit the Virginia ARES Web page at **http://www.aresva.org** for links to many other state and local ARES Web sites. Links to national emergency agencies, including FEMA, NWS, American Red Cross, Internet Disaster Information Center as well as the ARRL homepage are also there. A reference library contains emergency manuals and guides. Excellent and inexpensive training is available in the ARRL *ARES Field Resources Manual.*

Pacific Northwest Regional Public Service Conference Held in Oregon

Drawing 42 attendees, and a dozen presenters representing various served agencies and organizations throughout the region, the ARRL-sponsored northwestern public service conference convened at Seaside, Oregon, May 30. The conference was held in conjunction with the 1998 Northwestern Division Convention.

Conference objectives were to strengthen the relationships among public service program volunteers, the agencies they serve, and the ARRL Field Services Department; and to identify needs of served agencies and corresponding capabilities of Amateur Radio service providers in the 3-5 year time frame.

Field Services Manager Rick Palm, K1CE, welcomed conferees and opened the program with a description of ARRL Headquarters support services. Palm was followed by Tami Burroughs, KB7HEK, a communications specialist with the state Emergency Management who discussed Amateur Radio's role in state planning. Alan Polan, KE4TRR, a National Weather Service forecaster, commended amateurs for the excellent SKYWARN program in the northeastern part of the state and explained the value of SKYWARN ground reports. Oregon SEC and state RACES Officer Lew Williams, WB7NML, discussed ARES/RACES unification issues, new State Police issued ID cards, and plans for a new training program this year.

National Red Cross Headquarters Communications Coordinator Gary Gilham explained the national organization's emergency support functions under the Federal Response Plan, reviewed recent disaster responses, and commented that amateurs were essential resources in their past and future work.

Russ Fillinger, W7LXR, the northwest coordinator for the Salvation Army Team Emergency Radio Net (SATERN), discussed Salvation Army initiatives and his net that meets each morning on 14.265 MHz in support of the organization's communications needs. SATERN needs more volunteer-operators. Portland area Red Cross communications coordinator Keith Nichols, K7KEV, discussed regional Red Cross planning, operations, and needs for the future.

Union Pacific Railroad telecom electronic technician and ARES EC Gary Cooper's, N7ZHG, presentation on emergency service radio operators and their functions in support of public safety at the Umatilla Morrow chemical weapons depot fascinated conferees.

Oregon State Police officer John Beinhauer, W7BND, discussed Amateur Radio's role and future needs of the police dispatch center in Bend. Benton County EC Steve Griffith, KB7WND, covered his county's "posses" and the use of 2-meter voice and packet modes in search and rescue efforts. Idaho Secton Manager Mike Langrell, AA7VR, and State RACES Officer was on hand to explain his state's needs and the capabilities of his ARES and RACES organizations. Concluding the program was Larry Raaf, KC7WPG, Oregon State Emergency Communications Program Manager, who emphasized the importance of teamwork among responding agencies and organizations, while discussing the Office of Emergency Management's response system. A scheduled representative from the Oregon State Forest Service was a no-show, unfortunately.

Special thanks go to Master of Ceremonies and Section Manager Randy Stimson, KZ7T, for his efforts in arranging for the regional speakers. Stimson, who is stepping down after 11 years of dedicated service as SM, received a citation from ARRL President Rod Stafford, W6ROD, at the ARRL Forum on the same day as the conference.

A Field Appointment for Traffic Handlers

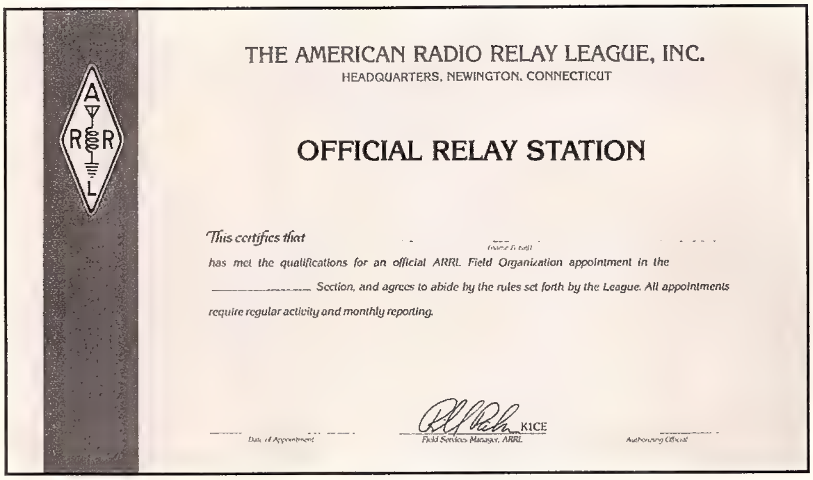
If you're involved with traffic handling and net operations or even interested in these important activities, why not be recognized? Sign up as an Official Relay Station (ORS) and be a part of the ARRL Field Organization family!

Official Relay Stations form the nucleus of the ARRL National Traffic System by checking into voice, CW and digital nets to pass traffic for the public benefit. As an official appointee, you'll gain experience and hone your operating skills that would really be valuable during an emergency. In addition, traffic handling is a wonderful social activity where friendships, many spanning the country, have been forged through NTS participation.

The Official Relay Station (ORS) is a traffic-handling appointment that is open to all license classes. This appointment applies equally to all modes and all parts of the Amateur Radio spectrum. It is for traffic handlers, regardless of mode employed or frequency band used.

Here are basic requirements for the appointment:

1) Full ARRL membership and Novice license or higher.
2) Code and/or voice transmission capability
3) Transmissions, by whatever mode, must be of the highest quality, both technically and operationally.
4) All ORSs are expected to follow standard ARRL operating practices
5) Regular participation in traffic activities, either independent or ARRL sponsored.
6) Handle all record communications speedily and reliably and set the example in efficient operating procedures.
7) Report monthly to the Section Traffic Manager, including breakdown of traffic handled during the past calendar month.



THE AMERICAN RADIO RELAY LEAGUE, INC.
HEADQUARTERS, NEWINGTON, CONNECTICUT

OFFICIAL RELAY STATION

This certifies that

has met the qualifications for an official ARRL Field Organization appointment in the ________ Section, and agrees to abide by the rules set forth by the League. All appointments require regular activity and monthly reporting.

Date of Appointment

K1CE
Field Services Manager, ARRL

Authorizing Official

To sign up as an Official Relay Station, please contact your Section Traffic Manager or Section Manager. Futher information on the Field Organization and a description of all the available appointments may be found in the *ARRL Operating Manual* and on the ARRL Web site. An on-line appointment application form may be found at this URL:**http://www.arrl.org/field/forms/fsd187form.html.**

Public Service Honor Roll
May 1998

This listing is to recognize amateurs whose public service performance during the month indicated qualifies for 70 or more total points in the following 8 categories (as reported to their Section Managers). Please note the maximum points for each category: 1) Checking into a public service net, using any mode, 1 point each; maximum 60. 2) Performing as Net Control Station (NCS) for a public service net, using any mode, 3 points each; maximum 24. 3) Performing assigned liaison between public service nets, 3 points each; maximum 24. 4) Delivering a formal message to a third party, 1 point each; no limit. 5) Originating a formal message from a third party, 1 point each; no limit. 6) Serving as an ARRL Field appointee or Section Manager, 10 points each appointment; maximum 30. 7) Participating in a communications network for a public service event, 10 points each event; no limit. 8) Providing and maintaining an automated digital system that handles ARRL radiogram-formatted messages; 30 points. Stations that qualify for PSHR 12 consecutive months, or 18 out of a 24-month period, will be awarded a certificate from HQ upon written notification of qualifying months to the Public Service Branch at HQ.

1015
NM1K
326
W9RCW
290
WD8V
258
K4SCL
249
WB2UVB
241
KA4FZI
226
WB4GM
224
KR4FXT
219
K4FQU
KA2YZM
KA2ZNZ
217
WA9VND
210
WA1TBY
204
N4ZNO
200
W2HPB
196
N5NAV
195
W6DOB
191
K2GNZ
W7TVA
190
N2LTC
N2XOJ
189
N2WFN
188
N2FET
W0OYH
KD4SIV
186
AF2HE
184
WB1GXM
183
N2OPJ
179
K7VVC
178
KA2GJV
N2CCN
N2YJZ
N5IKN
176
WB5NKC
AD4DO
K6YR
175
N0KJ
174
W9YCV
172
K9PQ
W5YQZ
171
W4EAT
KF1L
170
KK3F
168
K9FHI
KI0JO
WA1JVV
N2JBA
167
KE4AZL
W4PIM
WA5AA
164
N1CPX
163
K2UL
K9RTB
161
W9CBE
160
K4IWW
159
N2OJI
W6IVV
158
N9BDL
157
N2RPI
KB2VVB
156
WB5ZED
KR4MU
WA4GQS
155
KC4ZHF
154
K2DN
NR2F
153
KE4PAP
W7WAT
151
W3YVQ
150
KC2ACL
KC5OZT
149
KD4GR
NN2H
148
WA7EES
N2GJ
KT1Q
147
W7RFM
KU4JI
AF4GF
AD4BL
146
W5RZV
145
K7GXZ
N2TWN
144
AA4HT
WB4TVY
WN0Y
143
AF2K
N2WGF
141
W0LAW
N5OUJ
WB2ZCM
140
W7NWP
WO0A
K4CWZ
139
W7GB
WA4QXT
N7DRP
WB5NKD
138
W8IMX
N1VXP
W5CDX
W2MTA
NZ1D
AE4UB
136
KA1GWE
N3DRM
KT6A
135
WD8DHC
KB2KLH
KC5QZZ
134
K7BDU
N7YSS
WI2G
KE4OAV
133
AB7NK
KG6TU
N3WKE
KG0IV
WB0ZNY
K2BCL
132
K5DPG
KA9KLZ
KD7ME
K6AGD
131
KA2CQX
WA0TFC
KC4RNF
N2XJ
KF4NFP
130
W0OTF
KI4YV
W2PII
WA2UKX
W5ZX
W6QZ
129
AA1TE
W7ZIW
W2RJL
KS4DW
KF4TOX
KS4FB
128
KB2WII
WB2GTG
KA4UIV
127
KC2BYA
126
N2VQA
KD4PDQ
125
KB2CDB
W7VSE
124
W4BNY
W2EAG
123
W2FR
KA1WCD
N7AIK
122
K5IQZ
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K5AO
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N4JAQ
121
WA2CUW
K0PIZ
N2AKZ
120
N2FHJ
KE1AI
K4RBR
WD4JJ
WD5GKH
W7GHT
119
K9GBR
KA7AID
KC2CSQ
KO6RZ
118
KE4IFD
W7LG
WB0WNJ
AA9HN
WB2QIX
W4CKS
KB5TCH
WB2IIV
WB2FGL
117
K2YAI
W4XI
AE4EI
WB2CZW
116
W9ZY
N4YYQ
115
N1LKJ
W2JHO
KD4PWK
114
WA4EIC
KA7TTY
KG2D
N3RB
KE6MIW
113
K8MHR
KB2UQZ
WB7VYH
112
AG9G
WJ3K
KL7Q
K2VX
KA0DBK
111
N2AYK
N4GMU
110
N9KHD
KA2DBD
KC5VLW
WB5YDD
109
KG5GE
K4AIF
KC5QGI
108
K7MQF
KD5P
W2MTO
KC6SKK
KT4SJ
107
KC3Y
WD0GUF
106
KB2YJD
N3WK
W4DGH
105
N1YVV
KE3OX
AA3GV
KE4JHJ
K5UCQ
104
WL7COO
KC5PNM
103
K8XD
N2WDS
KD4DNO
102
K4BW
N1VUX
N5JUU
101
KF4HJW
NN7H
100
N2ZMI
K5MC
99
WA3WRT
KC5VOG
N1DHT
97
KD4HGU
AC4CS
W2PTZ
96
K5WOD
AB5RV
95
WB4UHC
W5RIT
WA2GUP
N1SGL
94
KB2VSD
K1SEC
92
KD4JMV
W7EP
N8JSO
KB2GEK
90
W2AZ
WB4ZNB
KA4LRM
89
KB2ETO
88
N0KWA
KD6YJB
87
WD9FLJ
86
N3ZKP
85
KD1SM
KE4CAP
84
W7PFD
WB0DTI
W0MZI
83
WB9GIU
82
KE4WBI
KB4WBY
KA9FVX
KJ3E
W2CS
WA5FXQ
81
WB4PAM
W2CC
80
WA4EYU
77
W4CAC
N2JRS
WD5AAH
W4RRX
76
K8SH
75
W4JLS
WA4LXP
74
W7UVP
K5DMC
W4ZBA
KD5MC
N1AKT
KO4OL
73
N4MM
72
W5CTZ
70
KB2RHI
KB2VSR
KB2YBM
N2FHK
N2SOE
KB2HJJ
KD4CAU
WA1QAA
N7MPS

The following stations qualified for PSHR during the month of April, 1998, but the results were not reported: NN7H 106, WJ3K 102.

Section Emergency Coordinator Reports
May 1998

There are 41,631 ARES members accounted for in SEC records. The following section emergency coordinators reported: KY, MDC, MI, NC, NFL, NLI, NV, OH, PAC, SD, SFL, TN, VA, VT, WMA, WV, WWA.

Section Traffic Managers Reporting
May 1998

AL, AR, AZ, CT, EMA, ENY, EPA, EWA, IA, ID, IL, IN, KS, KY, LA, MDC, MI, MN, MO, NC, NE, NFL, NH, NLI, NM, NNJ, NTX, NV, OH, OK, OR, ORG, SBAR, SC, SD, SDG, SNJ, STX, TN, VA, VT, WI, WMA, WNY, WV, WWA.

Brass Pounders League
May 1998

The BPL is open to all amateurs in the US, Canada and US possessions who report to their SMs a total of 500 points or a sum of 100 or more origination and delivery points for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in standard ARRL radiogram format.

Call	*Orig*	*Rcvd*	*Sent*	*Dlvd*	*Total*
NM1K	893	351	1143	8	2359
W1FYR	0	1123	1122	4	2249
KE4DNO	1	278	1865	2	2155
W3VR	710	359	990	59	2118
WX4H	2	503	1519	8	2032
K9JPS	2	736	42	559	1302
N2LTC	0	505	525	12	1042
W1PEX	0	700	225	1	926
WA9VND	27	447	383	22	879
W3KOD	0	348	362	2	712
W7AMM	128	224	329	31	712
WB9JSW	0	393	43	261	697
W5YQZ	0	321	358	4	683
KI0JO	0	260	394	0	654
W9RCW	0	361	58	227	646
KT6A	4	386	281	4	675
WA1TBY	0	286	253	42	581
WB0WNJ	0	189	389	0	578
K4DOR	101	178	279	0	558
N3DRM	10	262	234	18	524
K7VVC	24	226	266	7	523
N2YJZ	11	235	246	19	511
KA2YZM	27	193	243	44	507
KK3F	25	93	340	42	500

BPL for 100 or more originations plus deliveries: W3IVS 197, N5IKN 148, K5GBN 141, KF4VEX 124, K4SCL 120, KF4FXT 117, KA4FZI 113, W3KH 106.

The World Above 50 MHz

—Emil Pocock, W3EP*

What a Month of May!

The most widespread, long-lasting and spectacular tropospheric ducting session in many years affected the southeastern quarter of the country for nearly the entire month of May. Day after day, from early evening to mid-morning, Florida and Texas stations had a pipeline across the Gulf of Mexico. Signals were often incredibly strong on 144 through 1296 MHz. Thousand-mile (1600 km) contacts were commonplace, and even 10 W stations got in on the action. On selected days, the duct extended northward into Tennessee, Oklahoma, Kansas and even further. CO2OJ worked as far north as Kansas on 144 MHz and was on one end of several of the longest contacts. Selected New England stations even got in on the excitement one morning, when they worked as far south as Florida—and Cuba!

Overview on 144 MHz

It is difficult to summarize 25 days of exceptional conditions on five bands in just a few words. Most of the activity and longest contacts were made on 2 meters, which can provide a good overview of the entire event. Figure 1 shows some typical 2-meter paths, especially those that suggest the apparent limits of tropospheric ducting. Some exceptionally long contacts are shown with darker lines. All reported contacts over 2000 km are also listed in Table 1.

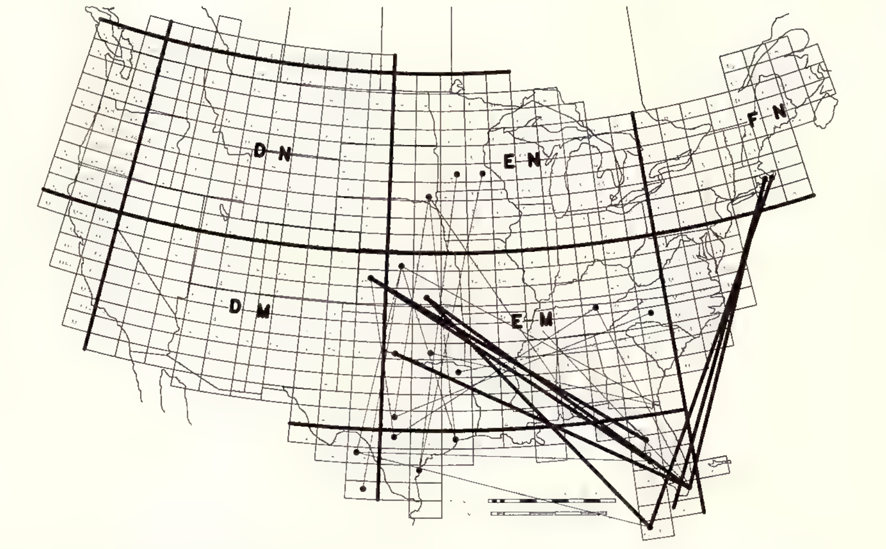

Figure 1—Some typical and 2000-km (thicker lines) paths during May via tropospheric ducting on 144 MHz.

Table 1—Long Distance 144 MHz Ducting Contacts in May

Date	*Distance (km)*	*Calls (grids)*
15	2340	W1LP (FN41)—CO2OJ (EL83)
14	2295	N0KQY (DM98)—WB2QLP (EL96)
14	2148	N0KQY (DM98)—WA4LOX (EL87)
14	2129	W0EKZ (EM17)—CO2OJ (EL83)
15	2150	W1LP (FN41)—W4WHN (EL94)
14	2145	N0JK (EM17)—CO2OJ (EL83)
21	2115	N0KQY (DM98 —KT4AL (EL88)
14	2100	N0KQY (DM98)—W4LAF (EL87)
15	2080	W1FIG (FN41)—W4WHN (EL94)
15	2000	W1LP (FN41)—W4EMB (EL95)

The activity on May 14 and 15 was among the most exciting of the month. Stations well to the north finally made it to the Gulf Coast after nearly two weeks of mainly trans-Gulf propagation. W7XU and N0QJM (both EN13), W0OHU (EN34) and KB0PYO (EN24) worked down to W5UWB (EL17) on the Gulf coast at distances between 1700 and 1900 km. N0LL (EN09) exchanged reports with W5UWB not only on 144 MHz, but also on 222, 432 and 1296 MHz. These 1311 km contacts were the longest N0LL had ever made to the south.

Some of the greatest excitement that evening was generated by Oscar Morales, CO2OJ (EL83). Oscar was making contacts into Texas and throughout the southeast earlier in the month. On May 8, he completed with XE2OR (DL98) at around 1850 km, his best DX so far and a new country. Jon Jones, N0JK (EM17) reported that he heard Oscar running a huge pile up from Texas, Oklahoma, Kansas and adjacent states on the evening of May 14-15. Connie Marshall, K5CM and N5KW (both EM25) in Oklahoma were among those delighted to make contact with CO2OJ.

When Oscar completed with W0RRY (EM26) and W0EKZ (EM17), the latter over a 2000-km path, Jon packed his transceiver and a four-element Yagi in the car and drove out to a rise east of Wichita. There he exchanged 55 reports with CO2OJ at 0422. The distance was 2145 km. That was not quite the climax of the evening. Larry Lambert, N0LL (EN09) picked up the story. Larry got home late that night, but quickly worked XE2OR and XE2KK (DL96), as did many others. He heard the CO2OJ contact with K5CM, but also heard N0KQY (DM98) in western Kansas calling Oscar. Had the pair gone on to make contact, it would have been over a record-breaking 2482-km path.

Oscar ran 100 W to a nine-element homebrew Yagi mounted on the roof of his Havana house. He had many difficulties on 2 meters, including QRM from huge pile-ups and interference from the second harmonic of a local 72 MHz broadcast station. He hopes all those he missed understand the problems from his end.

Ducting conditions extended northward along the East Coast the next morning as a high-pressure region expanded over New

This Month

August 1-2	ARRL UHF Contest
August 7-9	International EME Conference (Paris, France)
August 9	Good EME conditions
August 13	Perseids Meteor Shower Peaks
August 15-16	ARRL 10-GHz Cumulative Contest
August 21-23	Eastern VHF/UHF Conference (Enfield, CT)

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*Send reports to Emil Pocock, Box 100, Lebanon, CT 06249. Leave voice messages at 860-642-4347, or fax 860-594-0259 or e-mail **w3ep@arrl.org**.

England and the Maritime Provinces. Clint Walker, W1LP (FN41), had great success from Cape Cod. He ran off 20 QSOs with southern-Florida stations, several at distances exceeding 2000 km. The longest was with W4WHN (EL94) in the Florida Keys.

Clint reports that signals were exceptionally loud. At one point, he cut back his power to 1 W and could still be heard in Florida. Other New England stations further inland, including W1FIG (FN41) and W3EP (FN31), worked a few stations in Florida that morning, but they could not keep up with Clint's pace.

W1LP was also working stations in Nova Scotia and New Brunswick off the back of his beam at the same time—if only the Canadians could have made it down to Florida as well! They did not, but on his very last QSO of the morning, Clint did come up with the longest tropo contact of the entire opening—CO2OJ at 2340 km.

On May 10, when conditions had temporarily subsided over the southeastern US, Albert Pratts, WP4MWK, reported an unusual 2-meter FM QSO through the146.640 MHz New Port Ritchey, Florida repeater. He and at least one other Tampa Bay area station chatted with HR6OGS on Roatan Island off the north coast of Honduras. The distance was about 1100 km, not remarkable in the context of what else was going on, but it did suggest that much longer CW/SSB contacts across the Gulf of Mexico and Caribbean could have been made.

222 MHz and Higher

Activity on the higher bands was more modest than on 144 MHz, but coverage was similar. Contacts in the 1000 to 1500 km range were common, but the longest paths on 222 MHz and higher were somewhat shorter than the best on 144 MHz. Even so, several record- and near-record-breaking contacts were made. K2RTH (EL95, in southern Florida) was well situated to be on one end of many of these impressive contacts. On 222 MHz, Bruce made an 1814 km QSO with K5SW (EM25) and one at 1883 km with K1FO (FN31). On 432 MHz, K2RTH ran 90 W to a single Yagi, but hooked up with K1FO again for another 1883 km QSO. Other reported long contacts included K5VH (EM00) to K4RF (EM84) at about 1550 km.

At least one exceptional 902 MHz contact was made on May 22. At 1100, N5WS (EL09ra) completed with K0VXM (EL98pj) over a 1747 km path, the longest terrestrial contact ever recorded within North America on that band. This exceeded the existing record—also made from Texas to Florida—by 22 km. On 1296 MHz, K2RTH found several Texans between 1800 and 1900 km distant, including W3XO (EM00), N5WS (EL09), WA5TKU (EL13) and K5VH (EM00). Bruce was running just 3 W to a single 10-foot-long Yagi. K5VH and K4RF also hooked up on 1296 for another 1550 km QSO.

In addition to the calls mentioned in the summaries, many others sent in reports. Thanks to W4QS, WA4HFN, KB4OGM, KT4AL, KB5SQK, KI5GF and to others I may have missed in the huge pile of papers cluttering my desk.

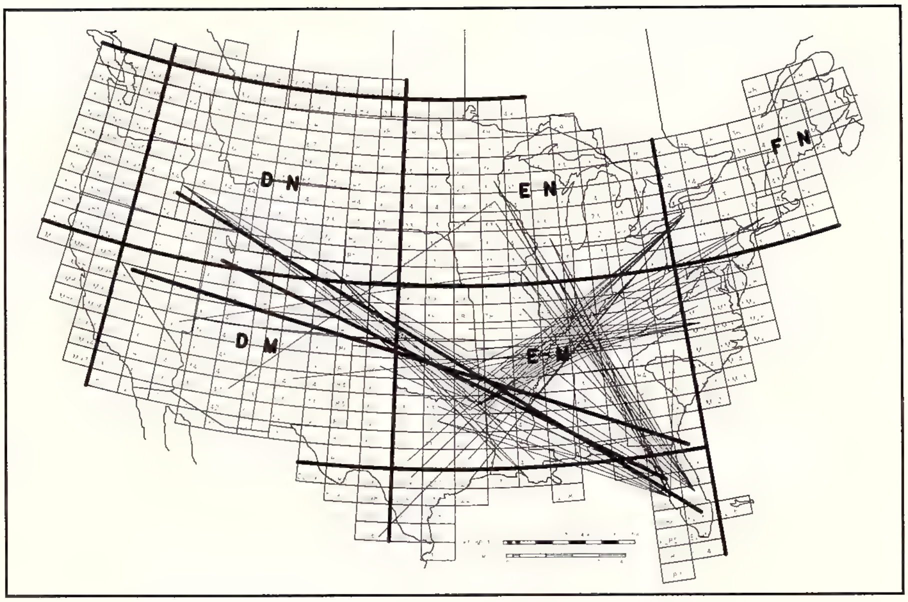


Figure 2—All the reported 144-MHz sporadic-E contacts made between 2210 May 28 and 0120 May 29. The thicker lines represent double-hop paths longer than 3000 km.

Table 2—144 MHz Double-Hop Sporadic-E Contacts on May 29

Time	*Distance (km)*	*Calls (grids)*
0042	3635	WA7GSK (DN13so)—W4FF (EL96am)
0115	3616	KF7UV (DM08dv)—W4UE (EM90gc)
0047	3027	WA7PXD (DN30xp)—WA4CHA (EL88qa)

Was It El Niño?

Ducting across the Gulf of Mexico is common enough in early spring, but it is unusual for such episodes to last for more than a few days at a time. Tropospheric ducting persisted for so long this past May because a sprawling dome of high pressure settled over the southeast for much of the month. It was trapped in this position by the jet stream, which made a huge loop to the north over the Great Lakes. This is called a blocking high and is more common over the southern US in late summer.

It is not clear why a blocking high sat for so long over the southeast during the month, but many other areas of the world also experienced abnormal weather during the first half of the year. Some of this weather was clearly triggered by the regional effects of El Niño warming of the eastern Pacific Ocean, but it is not so evident that May's blocking high can also be linked directly to El Niño. There may be a connection, suggested by the behavior of the jet stream, but global weather and climate is infinitely complicated. It may be tempting to blame May's outbreak of tropospheric ducting on El Niño, but most meteorologists are a bit more cautious about jumping to that conclusion. As Geoff Fox, WA1U, and New Haven TV weather forecaster noted, "remember, it's normal not to have normal weather!"

ON THE BANDS

In addition to the widespread tropospheric ducting across the southeast, sporadic E got off to an unusually strong start in May. There was E-skip on 50 MHz nearly every day of the month somewhere in the country, and there were at least eight days with double-hop conditions. West Coast stations also worked Alaska and Japan on sporadic E! At least two sporadic-E to transequatorial links allowed widely scattered US and Canadian stations to work South America on 50 MHz. A great 144-MHz E-skip event affected a large portion of the US on May 28-29. In addition, a significant aurora appeared May 2 to 4, and there was 6-meter auroral E on May 29 and on other days in northerly latitudes. Indeed, every section of the country took part in some extraordinary VHF propagation conditions this past May. Dates and times are in UTC.

Six-Meter Sporadic E

Single-hop sporadic E appeared on every day of the month, except May 3 and 11, according to the deluge of reports received. Double-hop conditions occurred on May 4-5, 7, 16-17, 18-19, 22, 26-27, 28 and 31 at least. May usually opens the E-skip season, but rarely with such intensity! Thanks for all the reports, including those from VE1IWF, KB2TGU, N4ZK, WA4LOX, W5CTV, W5DF, W5UWB, WA5IYX, KC6WFS, KE6SHJ, WB9YTG, W0MTK and KA0ZYD, which could not be mentioned individually in the space available.

Many 6-meter operators noticed how well activity was spread out every time the band opened. It was common to find stations as high as 50.250 and calling CQ on 50.200 and above. Many 10 W stations found they had greater success in clear spots higher in the band. There were often several CW stations active below 50.100 MHz as well. Everyone could find a QRM-free space to operate and have a good time. There were many comments on the significantly lower level of QRM and jostling as a result. This was especially true around 50.125, even though some operators still insisted on parking there when the band was open.

Single-hop contacts, even with low power and simple antennas, were common and widespread throughout the month. Many newcomers discovered just how easy it was to make 1000-mile (1600 km) contacts when the band was open. It was nearly as easy to make the more unusual double-hop contacts—and there were plenty of those as well. The experiences of Bill Neylands, KF4EHP (EL99), were typical. Bill runs just 6 W, but during the May 16-17 Sprint, he was able to work WB6QIW (DM04) and N6RMJ (DM14). Many others reported coast-to-coast contacts during that evening, making for a very lively contest.

Tom Weber, AB7UQ (DN52), thought the opening of May 18-19 was the best to date since he moved out to Wyoming for the summer. Tom ran off 216 QSOs with eager takers in 51 grids during the evening, including some on the East Coast. NX8M (EM79), K8TQK (EM89), KJ4SO (FM05) and KC8DMN (EN90), among others, heard and worked Southern California about the same time. W1GUD (EL87) found AB7CE (DN36) in Montana for a fine catch. W7XU (EN13) heard the TI2NA beacon beginning at 2352, but repeated calls brought no response.

May 26-27 not only featured double-hop across the continent, but also at least two hours' worth of propagation to the Caribbean. N5JEH/C6A was giving out FL14 to stations in the eastern half of the country, mostly on 50.170, throughout much of the day. Ed Rodriguez, WP4O (FK78), logged a page full of contacts beginning around 2030, including VE1ZZ and VE1RJ (both FN84) in the north to N4JJ (FM03) in the south. KP4SQ, KP4BZ and KP4HX were also active that afternoon. N8ZJN (EM79) heard XE3RCM/b (EL50) and found the band open to Idaho, Wyoming, Colorado and California later in the evening. The next day, WP4O worked W5FF (DM64) at 1937 for a nice 4325-km double-hop contact.

There was more double hop on May 28. Bryan Turner, W8LN (EM64), worked into California using 8 W and a dipole. Arnie Coro, CO2KK (EL83), found N7ML (DN45) and WA0DYU (DN32) for new states—Montana and Idaho. Stations from the Midwest to Florida finally worked Costa Rica. KA9CFD, K1MOD/9, KD4ESV and no doubt others heard TI4JHQ and TI7WAM as early as 2115.

VP2V/K9VV (FK78), on the British Virgin Islands, noted generally poor 6-meter conditions during his stay. Not until May 30 around 1600 did Fred finally get some action when he worked 15 stations from Florida to the Midwest. The month ended with more coast-to-coast contacts during the afternoon of May 31. New England stations worked widely throughout Arizona, southern Nevada and adjacent California.

Alaska and Japan on 6-Meter Sporadic E

Alaskans worked all along the West Coast on May 27, the same day there were great double-hop conditions across the continent. VE7SKA (CN88) found KL7FZ (BP51) as early as 0250. N5JHV (DM62) caught KL7FZ and NL7OW (BP40), well over 4000 km distant, after 0300. KC6WFS (DM04) caught up with KL7NO (BP54) at 0545, and many others, especially in the Pacific Northwest, heard or worked the Alaskans.

Two days later, N6CA (DM03) and N6XQ (DM12) extended the path beyond Alaska by two additional hops to work several Japanese stations at distances between 8700 and 9100 km. The first station the pair of Californians heard was JA1VOK (QM05) calling CQ. N6CA hooked up with Hatsuo first at 0654 and went on to work JJ2IVP. N6XQ was able to make contact with JE1BMO, JE1HLR and JF2HIV. Conditions were difficult. CW signals peaked S6, but QSB made copy difficult. In addition, there was tremendous QRM from Japanese stations soon after the initial contacts were made. N6XQ and N6CA heard many others calling during the 10 minutes the path was open, but could not pull out more calls. Both run 1000 W and eight-element Yagis.

Jon Jones, N0JK, as he made contact with CO2OJ on the evening of May 14 (local time). Jon was parked "on a rise," as he put it, a few miles east of Wichita, Kansas (EM17).

First Hints of Transatlantic E-Skip

VE9AA and K1TOL heard 48.250 MHz video signals from Spain and Portugal on May 11 and VE1PZ reported more video on May 13 and14. KP4EIT worked EH8BPX on May 16 at 1925, probably via sporadic E. A more widespread 6-meter transatlantic sporadic-E opening took place on May 25 after 2120, when Arnie Arnott, VE1IWF (FN84), KP4EIT, WP4O and KP4BZ all worked EH8BPX. GI0OTC and MM0AMW both reported hearing the VE8BY beacon on the evening of May 24, probably via auroral E. The first North America to Europe 6-meter contacts had to wait until June.

Two-meter Sporadic E

Widespread and record-making 2-meter sporadic-E appeared during the afternoon and early evening of May 28-29. Savvy operators noticed the rather short skip on 50 MHz and were alert to the possibilities for 144 MHz. Some 2-meter E_S contacts had already been made by 2214, when W3EP (FN31) snagged KM5PO (EM23) in Texas on a CQ for his first of the evening. KM5PO later worked others stations from New Jersey to Virginia. The final contacts apparently occurred after 0115. Even though E-skip conditions were favorable on 144 MHz for more than three hours, most operators reported that the opening was not stable. There was considerable fading and long periods when no stations were heard.

Figure 2 shows the extent of the openings. An analysis of path midpoints suggests that there were several intense sporadic-E regions. The most active and widespread covered a wide area extending from the Ohio River to the Gulf Coast and from the Appalachians to the Texas and Oklahoma borders. This region supported many paths up to 2300 km all across the eastern half of the country.

Typical were the contacts by Ron Silver, WA4LOX (EL87). Beginning about 2300, Ron made 10 contacts into Minnesota and Illinois, and later to Texas and Kansas. Gary Flynn, KE8FD (EM89), worked a number of southern Texans in EL29 and EM20 between 0043 and 0102, and finished the evening with XE2KK (DL96). K2TXB (FN02) ran a string of stations in eastern Texas, Oklahoma and Arkansas. Many reported new states and grids worked.

Smaller regions of sporadic-E activity centered over Oklahoma and Colorado provided some additional contacts in the West. K0GU (DN70) in Colorado worked seven stations in Louisiana between 0030 and 0055. KM5PO added WA7GSK (DN13, in Idaho) to his run of eastern states. Other contacts were made from Minnesota to Arizona and Illinois to Nevada.

The alignment among the various sporadic-E centers was such that some quite remarkable double-hop contacts were completed from Florida to Idaho, Nevada, and Utah. See Table 2 for a summary of these record-breaking 3000-km contacts. At least two of them have clearly exceeded the listed American sporadic-E DX record of 3495 km by more than 100 km, but the listed distances are based on published grid locators. These two contacts are close enough that further careful documentation will be needed before a new record can be proclaimed. In any event, congratulations go to WA7GSK, W4FF, KF7UV, W4UE, WA7PXD and WA4CHA for their remarkable contacts.

Two less spectacular 2-meter E-skip openings took place later in the month. Leo Fahmie, KJ6HI (DM03), snatched K7CW (CN87) during a very brief opening on May 29 at 0325. Al Olcott, K7ICW (DN26), reported a somewhat longer event the next day. Al found W0EKZ (EM17) at 0025, then KA9CFD (EN40), AE0G (EN10) and K0MQS (EN31) at 0117. Al also noted some field-aligned irregularities (FAI) later. He worked N5WS (EL09) by this means at 0254. In addition, neighbor K7CA worked K0FF (EM49) on E-skip and KK6IT (EM11) on FAI.

K4QI, NS4W, W5CTV, N6YM and N0LL also contributed reports that made the 2-meter sporadic-E summary possible. Many thanks to them.

More Six Meter DX

Transequatorial (TE) and true F-layer contacts diminished considerably during May, as expected, but did not vanish entirely. Europeans worked into southern Africa on at least six days, with the fortunate ones picking up 3B7RF (LH89), the Agalega Islands in the Indian Ocean. Brazilians worked southern Europe as far east as Greece on at least three additional days.

US and Canadian stations participated in some of the TE action, probably via sporadic-E links. On May 1, W3JO, K1TOL and possibly others found PY2DP and PY5CC around 2200. A more widespread opening took place on May 16. Nestor Zucchi, LW5EJU, logged 11 stations between 2150 and 2236, from VE1IW (FN84), W1AIM and K1LPS (both FN34) in the northeast, to KA0JGH (EN10) and K0TLM (EM29) in the center part of the country, and K5WXN (DM61) and N5JHV (DM62) in the west. K9AKS (DM04) heard the tail end of the Argentine opening and reported several locals working the LUs, but he did not make a contact. W1AIM also worked LU7FOJ and CX6DH, and W1RA made four contacts altogether, adding LU5JAU to the list. VE9AA completed with CX6DH for a new country.

Japanese stations continued to pull out some remarkable 6-meter DX. On May 1, JA6QGG worked 8Q7QQ in the Maldives, the last day operator HB9QQ was active from the Indian Ocean islands. This was probably normal F-layer propagation. JA1VOK worked 9M2TO (West Malaysia) on May 17 and UA0DX (PN68) on May 30, both probably via sporadic E.

222-MHz Standings

We compile band standings for 222 MHz each June 1 for publication in the August issue. There are two requirements for inclusion in this list: US operators located east of the Mississippi River must have worked at least eight states. All operators must have submitted information within the previous two years. (You need not work additional stations to remain in the standings, but please confirm your continued interest.) Submit data by e-mail to: **standings@arrl.org** or mail paper submissions to Steve Ford, WB8IMY, ARRL, 225 Main St, Newington, CT 06111. To request new report forms, send an SASE to the same address.

Call sign	*State*	*States*	*DXCC*	*Grid Squares*	*Best DX† (km)*
W1JR*	NH	47	4	87	2050
K1FO	CT	25	2	52	2021
K1TEO	CT	24	2	89	1720
AF1T	NH	24	2	—	2019
K1ZE	RI	18	3	53	1358
KD1DU	CT	16	2	45	1817
W1AIM	VT	14	2	37	985
N1LZC	MA	13	1	20	1080
K2LME/1	CT	11	—	15	509
K1WVX	CT	9	1	11	973
N2WK	NY	28	3	87	1960
K2OS	NY	26	2	50	1559
K2AN	NY	19	2	52	1043
WB2VVV	NJ	16	2	29	779
WA2BAH	NY	14	2	32	1740
W2WW	NY	13	2	—	—
W2CNS	NY	12	3	29	626
W3HHN/2	NY	12	2	22	1170
W2FCA	NY	9	2	15	320
KA2MCU	NY	8	2	18	480
W3ZZ	MD	34	2	97	1862
KB3PD	DE	22	—	49	—
K3UA	PA	20	2	46	1400
KH2CY/4	VA	11	1	22	725
K4RF	GA	37	2	105	1968
N4CH	VA	30	1	73	2000
NA4I	GA	24	1	52	1485
N4UK	SC	21	1	51	—
K4ZOO	VA	21	2	59	1410
K2RTH	FL	15	2	38	1899
K4RTS	VA	13	2	43	742
K4CKS	GA	13	1	15	—
WB4JEM	FL	12	1	47	1647
W4UE*	FL	9	1	14	1500
W4SW	VA	8	1	22	520
WD4O	VA	8	1	19	520
W5LUA*	TX	50	—	—	—
W5FF*	NM	50	—	—	—
W5RCI	MS	37	1	105	—
K5SW	OK	31	2	108	2051
W5ZN	AR	20	2	50	1940
AA5C	TX	15	2	59	1843
WA5TKU	TX	14	—	28	—
W5AL	TX	13	2	53	1750
W5UWB	TX	10	2	30	1664
N5QGH	TX	8	—	27	—
K5RHR	NM	5	—	23	577
WB4AYE	CA	2	1	14	400
WA7KYM	WY	11	1	34	1822
KE7SW	WA	3	1	13	410
N7YAG	OR	2	1	12	330
KE8FD	OH	33	2	117	1655
N8DJB	OH	30	2	91	—
K8MD	MI	26	2	60	1170
KU8Y	MI	24	2	80	1406
N8ZJN	OH	21	2	41	1253
N8KOL	OH	23	2	61	1510
N8XA	OH	21	2	71	—
NQ8A	MI	18	2	48	1205
K2YAZ	MI	15	2	59	1200
WB9SNR	IL	25	2	56	1745
W0UC	WI	22	2	95	1471
N9LAG	IL	13	1	32	828
W9JN	WI	12	2	49	1342
WA1MKE/7	IN	11	2	29	400
N0AKC	WI	10	1	17	
W9EME	WI	8	2	—	—
N0HJZ	MN	23	1	71	1530
KM0A	MO	23	—	70	1350
W0JRP	MO	22	1	69	812
N0LL	KS	19	1	85	1691
K0FF	MO	18	1	52	1174
WA0BWE	MN	17	1	56	1264
NT0V	ND	16	2	32	1870
W0ZQ	MN	15	1	61	1175
KB0IKP	MN	14	2	57	707
WQ0P	KS	12	—	54	—
WA2VOI/0	MN	10	—	20	—
K0RZ	CO	9	1	40	2040
WA2HFI/0	MN	7	1	14	868
N0KE	CO	5	1	23	600
KF0GX	MN	2	—	5	180
W0LD	CO	2	—	3	632
VE3AX*	ON	50	4	62	1892
VE3KDH	ON	15	2	51	1093
VE6TA	AB	1	2	8	800
XE2/N6XQ		3	3	10	4142

— Information not supplied

*Includes some EME (moonbounce) contacts

†Terrestrial

Aurora and Auroral E

Aurora appeared as early as May 2 for some northerly stations, but the most intense activity took place on the evening of May 3-4. The K index hit a remarkable seven earlier in the day, but the geomagnetic field calmed down considerably by evening. Two-meter stations as far south as northern Georgia (EM84), Arkansas (EM45) and across to central California (CM06) got in on this event—one of the most widespread in many years.

In addition to the usual run of auroral contacts on 50 and 144 MHz, there was some welcome activity on the higher bands. Old aurora hand W0OHU (EN34) picked up five new grids on 144 MHz, but also completed with WA4HEI (EN65) on 432 MHz. Greg Mumley, W1RNA (FN34), made his first-ever 222 MHz aurora contacts with N2HLT (FN12) and K2SPO (FN13). K4RF (EM84) also found WA8RJF (EN91) on 222 MHz.

The 50 MHz auroral-E propagation that followed later in the evening was widespread across northerly latitudes. Mike Smith, VE9AA (FN65), heard the VE8WD beacon (DP22) for an hour after 0300 and chatted with VE8HL (FP53), but no western contacts resulted. K1TOL (FN44) worked numerous stations in Montana, Washington, Oregon and Alberta. Lefty also heard the OX3VHF (GP60), VE8BY (FP53), FP5XAB (GN16), VE4VHF and VE6ARC beacons after 0400. What a spread!

John Thomas, WX7R (CN85), had good success from the West Coast. He worked VE1IW (FN84) at 0403, then K1RQG (FN54), W1RA (FN41) and W2FE (FN13). These contacts are all in the 4100 to 4600 km range. John also heard VE8WD/b to the north. Derek Hutter, K7XD (CN85) worked a number of VE3 and W1 stations as far east as K1TOL (FN44) and found KL7NO (BP51) at 0612. Arliss Thompson, W7XU (EN13), worked a number of W7s and VE7s from South Dakota and heard the VE8BY beacon at 0555 at 2850 km distant.

Thanks to W1FIG, W1OA, N7LT, N7STU and N0LL for their useful aurora and auroral-E reports, not otherwise mentioned in the summaries.

NOTES FROM ALL OVER

5.7 GHz between the US and Russia

Al Ward, W5LUA, reports what is probably the first 5.7 GHz EME contact between the US and Russia, made on May 28. On the Russian end was RW3BP in Moscow, who ran 35 W to a 1.8-meter dish mounted on the side of an apartment building, 12 stories high! Al also had 35 W with a five-meter dish. Signals were quite weak, and it took several schedules to get a complete contact. Due to slight differences in frequency allocations, RW3BP transmitted on 5670.050 MHz while W5LUA was on 5760.100 MHz. Al believes this was the Russian's first 5.7 GHz EME contact anywhere.

EME Records Fall

Two EME distance records have been exceeded during the past few months. W7GBI (DM43am) and ZS6AXT (KG33vv) made a 2304 MHz EME contact over a distance of 16,076 km on March 14. This exceeded the 13,931-km QSO between ZL2AQE and W3IWI/3 of made on October 18, 1987. The 1987 accomplishment, which has stood as the 2304 MHz EME record for more than ten years, should have been listed in the tables published in this column. It had been inadvertently overlooked and the omission was noticed only recently. Congratulations to both the former and current record holders.

NU7Z (CN87st) and AF1T (FN43cd) extended the 902 MHz EME standard to 3924 km on May 23. AF1T was coholder of the former mark of 2,384 km, which held up for eight years. It seems likely that any further extension of the 902 MHz record will have to come from Alaska, Hawaii or Puerto Rico, as this band is unique to the United States.

VHF/UHF/MICROWAVE NEWS

Eastern VHF/UHF Conference

The 24th Annual Eastern VHF/UHF Conference will be held at the Harley Hotel, Enfield, Connecticut, August 21 to 23. Enfield is along I-91 near the Connecticut-Massachusetts line. The conference is sponsored by the Eastern VHF/UHF Society and the North East Weak Signal (NEWS) Group. The main program begins Saturday morning and concludes with a banquet, door prizes and trivia quiz in the evening. Receiver noise-figure measurements and laboratory demonstrations take place all day. A flea market and antenna gain measurements will take place Sunday morning.

Rae Bristol, K1LXD, at 860-742-8650, is handling registrations. Call 800-321-2323 for special convention rates for hotel rooms. For more information, contact conference chairperson Bruce Wood, K2LIV, at **bdwood@erols.com** or 516-265-1015. Check the NEWS Group WWW page at **http://uhavax.hartford.edu/~newsvhf**.

New Products

NUTEST FOR *WINDOWS*

◊ Now in version 1.5, *NuTest* is a PC-*Windows* based Amateur Radio exam package that provides students with the knowledge required to pass ham radio theory tests at all levels from Novice through Extra Class. NuTest prints or displays realistic tests and shows detailed explanations, diagrams, tables and correct answers.

Prices start at $14.95. For more information, contact author Tony Lacy, G4AUD, 58 Bilbrook Rd, Codsall, Wolverhampton, WV8 1ER, United Kingdom; **tony.lacy@btinternet.com**; **http://www.btinternet.com/~tony.lacy/**.

Digital Dimension

Stan Horzepa, WA1LOU*

Getting Beyond Y2K

Take a date, any date early in the year 2001, say, for instance, February 3. Depending on whether you live in England, America or Japan, this date can be written as "03/02/01," "02/03/01" or "01/02/03."

Depending on where these dates are subsequently read, they may be interpreted as 3 February, 2001; March 2, 2001; 2003 February 1; 2 March, 2001; February 3, 2001; 2002 March 1; 1 February, 2003; January 2, 2003; or 2001 February 3. Only three of these nine interpretations are correct!

If we expand the original date to a four-digit year, as in 03/02/2001, 02/03/2001, or 2001/02/03, there still are several possible interpretations: 03/02/2001 can be read as 3 Feb, 2001; or Mar 2, 2001; and 02/03/2001 can be read as 2 Mar, 2001; or Feb 3, 2001. Only two of those four interpretations are correct!

We don't really need this confusion, do we?

Ian Galpin, G1SMD (**g1smd@amsat.org**) has proposed a simple solution to this problem: Use a four-digit year with a year-month-day format. For example, today is 1998-08-11 or 19980811.

This format is defined in International Standard ISO 8601, and most of the world has "signed on" to this standard. The ISO format avoids the American-British date format ambiguity. It makes data and programs internationally portable, with no possibility of misinterpretation.

The use of the ISO format for the internal workings of computer programs usually ensures more compact code, and therefore, faster operation. The logical left-to-right "year-month-day hour:minute:second" precedence makes computer programming easier, and certain date-related algorithms become trivial when using this style. Using the ISO format and four-digit years should ensure that our software transitions correctly from 1999-12-31 to 2000-01-01 (programs using only a two-digit year may produce wrong results).

Having only one date format on ou computer screens and printouts means that programs work the same for everyone, everywhere in the world; only one program version is required for all markets. This will eliminate the need for a whole lot of "Date Format" menu options and make programs smaller and easier to write.

Using a fixed format for dates and times makes viewing lists of dates and times easier. It reduces the possibility for error. So, start using yyyy-mm-dd format now. Use it in packet messages, software, date stamps on data, QSL cards, satellite predictions, log-books etc.

Some people may prefer to write 1997-Apr-27. This is equally clear, and while this form is not covered by the ISO standard, it at least retains the same year-month-day ordering defined in ISO 8601.

The proposal regarding this format that is targeted directly at Amateur Radio operators is available at the Year 2000 and ISO 8601 Web page at **http://ourworld.compuserve.com/homepages/dstrange/y2k.htm** and **http://www.aegis1.demon.co.uk/y2k/y2k.htm** or **G1SMD's** Date-Time Standard Web page at **http://www.kirsta.demon.co.uk/iso_8601.htm**.

Digital Conference Coming to Chicago

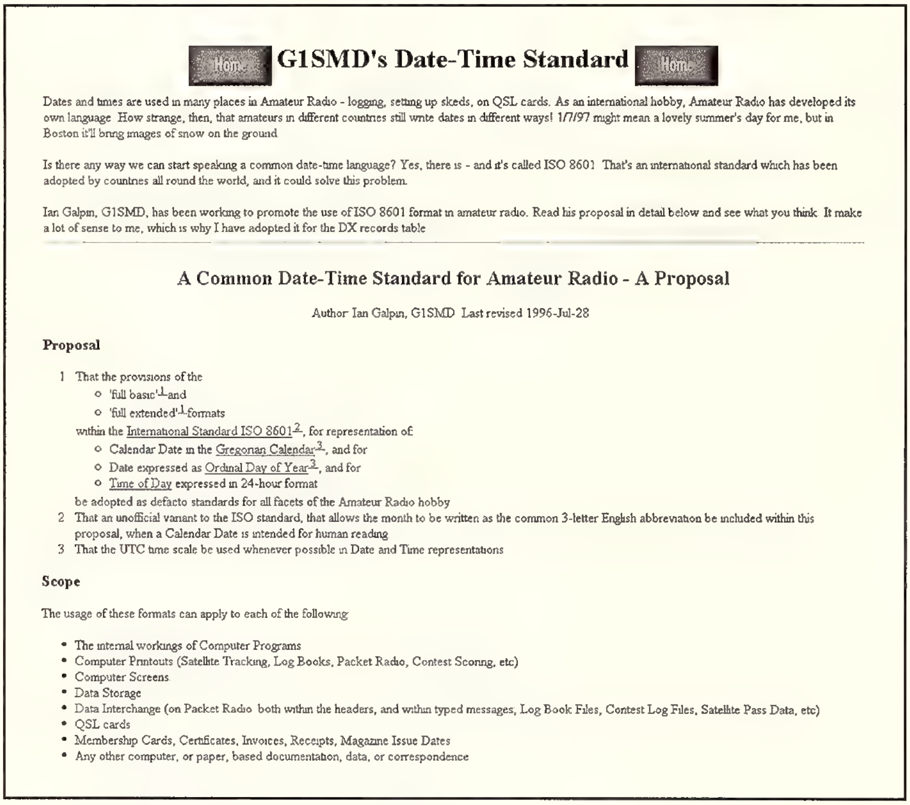
The 1998 installment of the ARRL and TAPR Digital Communications Conference (DCC) will convene on the weekend of September 25-27 near Chicago's O'Hare Airport. DCC is the place to be if you want to learn more about digital communications, networking and related radio technologies. It's also a great place to meet those who advance the digital-communication art.

Anyone interested in digital communications is invited to submit a paper for publication in the DCC *Proceedings*. Papers are due by August 15, 1998 and should be submitted to Maty Weinberg, ARRL, 225 Main St, Newington, CT 06111, e-mail **lweinberg@arrl.org**.

For more information, contact TAPR at 8987-309 E Tanque Verde Rd #337, Tucson, AZ 85749-9399; tel 940-383-0000, fax 940-566-2544; e-mail **tapr@tapr.org**; URL **http://www.tapr.org/dcc**.

My Rewired Web Page

I overhauled my Web page and by the time you read this, the new and improved WA1LOU Web page will be up and running for your viewing pleasure. So, surf on over to **http://www.tapr.org/~wa1lou** and check it out! QST



G1SMD's Date-Time Standard

Dates and times are used in many places in Amateur Radio - logging, setting up skeds, on QSL cards. As an international hobby, Amateur Radio has developed its own language How strange, then, that amateurs in different countries still write dates in different ways! 1/7/97 might mean a lovely summer's day for me, but in Boston it'll bring images of snow on the ground

Is there any way we can start speaking a common date-time language? Yes, there is - and it's called ISO 8601 That's an international standard which has been adopted by countries all round the world, and it could solve this problem.

Ian Galpin, G1SMD, has been working to promote the use of ISO 8601 format in amateur radio. Read his proposal in detail below and see what you think It make a lot of sense to me, which is why I have adopted it for the DX records table

A Common Date-Time Standard for Amateur Radio - A Proposal

Author Ian Galpin, G1SMD Last revised 1996-Jul-28

Proposal

1 That the provisions of the
    - 'full basic'[1] and
    - 'full extended'[1] formats

  within the International Standard ISO 8601[2], for representation of:
    - Calendar Date in the Gregorian Calendar[3], and for
    - Date expressed as Ordinal Day of Year[3], and for
    - Time of Day expressed in 24-hour format

  be adopted as defacto standards for all facets of the Amateur Radio hobby

2 That an unofficial variant to the ISO standard, that allows the month to be written as the common 3-letter English abbreviation be included within this proposal, when a Calendar Date is intended for human reading

3 That the UTC time scale be used whenever possible in Date and Time representations

Scope

The usage of these formats can apply to each of the following

- The internal workings of Computer Programs
- Computer Printouts (Satellite Tracking, Log Books, Packet Radio, Contest Scoring, etc)
- Computer Screens
- Data Storage
- Data Interchange (on Packet Radio both within the headers, and within typed messages; Log Book Files, Contest Log Files, Satellite Pass Data, etc)
- QSL cards
- Membership Cards, Certificates, Invoices, Receipts, Magazine Issue Dates
- Any other computer, or paper, based documentation, data, or correspondence

Figure 1—Getting beyond the mixed up confusion of Y2K is the goal of ISO 8601 and Web pages, like this one at **http://www.kirsta.demon.co.uk/iso_8601.htm.**

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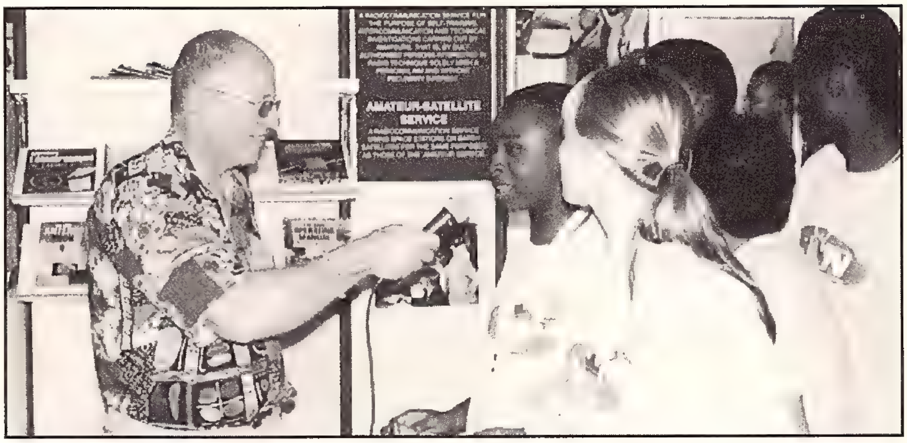
Amateur Radio Showcased at Africa TELECOM 98

In May, the International Amateur Radio Union took advantage of a unique opportunity to demonstrate Amateur Radio on the African continent. Africa TELECOM 98 was held May 4 to 9 at the Expo Centre in Johannesburg, South Africa, and attracted nearly 20,000 telecommunications professionals. IARU Region 1 organized a stand featuring a number of color posters depicting various facets of Amateur Radio. A small homebrew 80-meter transceiver was on display along with books about Amateur Radio. HF and VHF stations were operational using the call sign ZS98IARU. ICOM America kindly donated an IC-706 Mk II transceiver and companion antenna tuner that remain in South Africa to be used in an educational program.

Distinguished visitors to the IARU stand included Jay Naidoo, South Africa's Minister for Posts, Telecommunications and Broadcasting; ITU Secretary General Pekka Tarjanne; and TELECOM President Jean-Patrick Bare.

Astronaut Andy Thomas, KD5CHF, on board *Mir*, contributed to the success of the affair by participating on May 8 in a special link-up through the Johnson Space Center Amateur Radio Club to the IARU stand, where nine students representing the nine provinces of South Africa had the opportunity to speak with him. Following the contact, South African Telecommunications Regulatory Authority Chairperson Neppa Maepa said he and his department are now more convinced than ever that Amateur Radio must be introduced into schools in Africa.



IARU Satellite Adviser Hans van de Groenendaal, ZS5AKV, introduces Amateur Radio to children from nine South African provinces selected to attend Africa TELECOM 98 in Johannesburg. The children are participating in a live contact with astronaut Andy Thomas, KD5CHF, on board the *Mir* space station. The hookup was by telephone from the IARU booth to W5RRR at the Johnson Space Center in Houston.

Hans van de Groenendaal, ZS5AKV, attended a special forum on Emergency Communications chaired by Mohamed Harbi, Special Advisor to the ITU Secretary General, and presented a paper on Amateur Radio as a national and international emergency communications resource that was well received.

Assisting South African Radio League members in manning the IARU stand were Region 1 Executive Committee members Hans Ehlers, DF5UG, and Abdi Al-Shahwarzi, A41JT, and ARRL Technical Relations Manager Paul Rinaldo, W4RI.

Space at the Minneapolis Convention Center has been reserved for an Amateur Radio display and special event station during the ITU Plenipotentiary Conference to be held there October 12 - November 6. Among the Twin Cities amateurs who are helping put Amateur Radio's best foot forward are (l-r) Mike Sigelman, K0BUD;Jay Bellows, K0QB, Tod Olson, K0TO; Twila Greenheck, N0JPH; and Erv Grossman, K0IVO. Others assisting but not shown in this photo are Steve Fraasch, K0SF, and Smith Schuneman, W0DRU.

On May 9, 1998, the Guayaquil Radio Club, the IARU member-society in Ecuador, celebrated its 75th anniversary with a gala affair at the governor's building in downtown Guayaquil. An honored guest at the occasion was Justo Campana (left), the only living member of the original group of founders. Now 93 years old, Sr Campana was an enthusiastic participant in the celebration. Greeting Sr Campana is IARU President Dick Baldwin, W1RU.

Two New IARU Members Proposed

Voting is now underway on proposals to admit organizations representing radio amateurs in Tunisia and Ethiopia to membership in the International Amateur Radio Union. The IARU presently has 146 active member-societies in that many countries and separate territories.

The Tunisian Amateur Radio Club (Association Tunisienne des Radioamateurs, or ASTRA) was founded on March 10, 1997. ASTRA has 27 contributing members, 12 of whom are licensed to transmit in the amateur service. The society's address is: B. P. No. 73, CP 2055 Bir El Bey, Tunis, Tunisia.

The Ethiopian Amateur Radio Society (EARS) was founded in 1992. It has 30 members, 17 of whom are licensed radio amateurs. Those having licensed stations in Ethiopia are primarily foreign nationals, but a number of Ethiopian nationals have passed the examinations for United Kingdom licenses, hold UK call signs, and are in the process of applying for licenses in their own country. The society's address is: PO Box 60258, Addis Ababa, Ethiopia.

Applications for admission to the IARU are first reviewed by the appropriate regional organization—IARU Region 1 in the case of both Tunisia and Ethiopia. If the regional organization finds that the applicant is qualified, the application is submitted to the IARU member-societies for a vote by mail. The deadline for ballots on these two proposals is August 10, 1998. QST

FM & Repeaters

Edited by ***Jay Mabey, NU0X*** • *Editor,* The ARRL Repeater Directory

Stirring Up Activity

Peggy P. Kelly, N3PPG
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Isn't it interesting that with all the controversy over the LMCC proposal everyone is talking about how we need to generate more amateur activity on 440 MHz? Our solution was to create a 440-MHz FM net. The plan was set in motion when the notice appeared in *MiniNews*, the newsletter of the Montgomery Amateur Radio Club (MARC). It announced the debut of the "Just For the Fun of it Net" and invited everyone to show up at 7:00 PM on the MARC 70-cm repeater. Now I only had to come up with something to discuss!

Timing Is Everything

Coincidentally, the net began at the same time our MARC Novice-Technician classes convened. I positioned the net control station (that would be me) in the parking lot at the class site. The instructor, Farrell Becker, N3PPR, was the first to check-in while the class listened. Repeaters had been the topic of discussion in the previous week's class, so this was an excellent demonstration. Within minutes more operators joined the net and soon we were well underway.

The Results

After all was said and done, a total of 13 people checked in—from as close as the same parking lot to as far away as Reston, Virginia. My fears of finding discussion topics proved groundless. We talked about our rigs, our locations, the net itself and many other subjects for nearly an hour. Best of all, it was *fun*! (Remember waaaaay back when Amateur Radio used to be "fun" and we could walk away from a QSO without a scrambling for a dose of blood pressure medication?—*Ed.*) One of the beneficial things about holding the net on the high-profile MARC repeater was that everyone had a good strong signal!

Every net receives the occasional visit from Murphy. Unbeknownst to me, my H-T's auto-shutdown feature was enabled and set to 30 seconds! (Of course, I figured that out the day *after* the net.) Oh well, a little frustration is often educational. I learned quickly to manage the net with brief transmissions. Everyone had a great time and we are planning on making the net a regular event.

Editor's Note: Congratulations to Peggy and the MARC crew! Many repeaters offer code practice nets, traffic nets, swap nets and the ever-popular weather nets. SKYWARN in most areas of the country is a very useful (and yes, even *fun*) way to take part in your community's protection while using our precious spectrum and showing how important Amateur Radio is in the scheme of things! The more we use our frequencies and show what we can do for our communities, the better we'll be able to protect our spectrum.

DIAMOND UPDATE

As you may recall, we had a story some months ago from Charlie Paddock, AB8BR. His son's dog "Diamond" was capable of recognizing Charlie's call sign over the air. Whenever Charlie would call on the local repeater, Diamond would fetch Charlie's son and lead him to the rig. (Call it a *CCS*—canine-coded squelch!) A while ago Charlie related the sad news that Diamond had taken ill and was not expected to survive.

Recently I received a photo update from Charlie advising that Diamond had not only recovered nicely from the illness, but was also making progress in recognizing Charlie's new vanity call sign! What do you think folks? Is it the call sign or is it Charlie's *voice* that Diamond is recognizing? A neat story in either case!

Charlie Paddock, AB8BR, and the amazing Diamond.

"FM and Repeaters" Authors ... Please?

This column is here to cover VHF/UHF FM activities, both repeater and simplex. If you have any ideas or stories you'd like to contribute, feel free to drop me an e-mail (**NU0X@arrl.org)** or call (860-594-0241). I can use long pieces or short pieces—I can use more than one or edit them to fit as needed. Don't worry about your story telling capability—we can help! Photos are appreciated and used when available. Remember, if *you* don't submit material you are condemned to read *my* endless ramblings!—*NU0X* QST

New Products

MOBILE RF AMPLIFIERS FROM TELETEC

◊ Teletec's Amateur Radio mobile RF amplifiers are housed in die cast aluminum heat sinks to provide a powerful, yet low-profile package. With models for ham bands from 50 through 450 MHz, Teletec linear amplifiers operate on SSB, AM, FM and CW and feature automatic mode switching; automatic T/R switching; over/reverse voltage protection, built-in preamps; and use surface-mount technology throughout.

Prices start at $329. For more information, contact Teletec, 10101 Capital Blvd, Wake Forest, NC 27587-7788; tel 919-556-7800, fax 919-556-6180, **Teletec@Sprintmail.com**; **http://www.teletec-usa.com**.

BATTERY PACKS FOR HAND-HELDS

◊ Premier Communications has added NiCd and NiMH battery packs to its line of ADI radios, speaker mikes and antennas. Marketed under Premier's new brand name, PRYME Radio Products, the battery packs are compatible with hand-held radios from all major manufacturers, including ADI, Alinco, ICOM, Kenwood, Standard and Yaesu. For more information, see your favorite Amateur Radio products dealer or contact Premier Communications; tel 800-666-2654, **premier@adi-radio.com**. QST

YL News

Edited by **Diane P. Ortiz, K2DO***

YLs Gather at Dayton '98

The 1998 Dayton Hamvention, May 15-17, was blessed with sunny skies, 80° temperatures...and a strong YL presence!

From the Hara Arena, a large indoor area where the manufacturers and many dealers showed their wares, to the vast outdoor flea market, women hams were very visible. YLs were busy on both sides of the table, both as buyers and as sellers, with many demonstrating and explaining the latest, greatest (or oldest!) in ham and related gear. It was very satisfying to go up to a QRP booth and get a kit-building lesson from an experienced YL ham. Many manufacturers and dealers had female hams on their sales teams.

Times have definitely changed. At one Hamvention in the not-too-distant past, an infamous vendor featured scantily clad women showing his wares. "Did you see the babes in bikinis?" one convention-goer asked another. "Yeah, but I don't remember what they were selling!"

Of course, no one bothered to ask the women hams in attendance what *they* thought of the "demonstration." Thankfully, Hamvention vendors have finally adopted more modern sensibilities.

The Buckeye Belles/YLRL booth was a popular YL meeting place. Clockwise from the upper left, Carol, KB8VYB, YLRL receiving treasurer; Kay, WA0WOF, YLRL librarian-historian; Nobuko, JR6XIX, JLRA president; and Nancy, KC4IYD, YLRL president.

Fascinating Forums

Female hams of all ages were at the many forums and events. YLs packed the Young Ladies Radio League (YLRL) forum, held Friday morning in the Hara Arena. It was moderated by Kay Eyman, WA0WOF, YL columnist for *Worldradio* magazine and librarian-historian of YLRL. YLRL president Nancy Rabel Hall, KC4IYD, and Nobuko Uchiyama, JR6XIX, president of the Japan Ladies Radio Association, gave us updates of YL activity, information about various programs, conventions and ideas for attracting young women to the hobby. Nancy encouraged everyone to be active in their communities and participate in YLRL events, especially the contests and YLRL convention being held on the *Queen Mary* in Long Beach, California in late July1999.

There were many DX YLs there, and among the most interesting parts of the YLRL forum were the introductions. One at a time everyone attending the forum was given a chance to say something about themselves. Some were too shy to give more than their name, call and location, but soon the shyness disappeared, bolstered by the rapt attention and applause from the audience. It was fascinating to hear of the many diverse talents and experiences of the YLs there. The YLs detailed their very active lives, with Amateur Radio playing an important role.

It was exciting to have "eyelash QSOs" with many DX YLs at the forum including Noriko Tokura, 7K3EOP, who was there with Ann, WA1S, her friend from the Willis Island DXpedition last September (see "YL News" in the April and June *QST*s), Nellie, XE1CI, and Jody Millspaugh, VP5JM. These YLs are tops in their field in SSB, CW, contesting and DXing and RTTY. It was exciting to be able to talk to them face-to-face, and all in one place!

Many of the YLs at the forum were VEs (Volunteer Examiners). They were particularly interested in the portion of the forum that discussed the need to get more young girls involved in Amateur Radio. They suggested some strategies, then asked the young girls in the audience how they became hams. One of the girls, Crystal Hart, KC0AJF, got started with a youth group called BARC Juniors of Boulder, Colorado.

I saw Crystal again at the Youth Forum on Saturday, moderated by another very active YL, Carole Perry, WB2MGP. Carol said that this year she was overwhelmed with youngsters who wanted to participate in the forum. The Youth Forum is a very popular event at the Hamvention and highlights youngsters who are active in ham radio. Carole said this is the first year she had to turn people away because she had too many! That says something good for the hobby, and for her very successful efforts. Carole is a teacher in Staten Island, New York, and through her full-time job as an instructor has introduced hundreds of young people to ham radio.

Out and About

Many YLs were able to see each other again at one of the most popular YL hangouts—the Buckeye Belle/YLRL booth. Here you could sign-in, find out information about YL activities and clubs, and always find a friendly face to answer your questions. After hours of walking around this giant hamfest, it was a welcome retreat!

There were many YLs who were busy working this Hamvention in many different capacities. Jennifer Gagne, N1TDY, ARRL Media Relations Manager, always managed a smile, even though I think she was on her feet for the entire hamfest. She helped staff the ARRL booth and chaired a media forum. At the forum Jennifer offered advice on how to work with your local newspaper and make your story more appealing to the media. Many YL PICs (Public Information Coordinators) and PIOs (Public Information Officers) attended.

Whether shopping for a good buy, or working behind the tables, YLs were visible and active everywhere at the Dayton Hamvention. My unofficial observation, after eight consecutive Hamventions, is that there were more licensed women and girls in attendance this year. Overall attendance was somewhat higher this year, with a final figure of just over 28,000.

The Dayton Hamvention was a tiring, exciting, educational experience this year, as it usually is. The major manufacturers were out in force and you needed a strong back (to carry all your purchases and flyers), the determination of a marathon runner and the constitution of a camel to survive the three days of activity. Hope to see you there next year!

33, Diane, K2DO

(Check out the YLRL Web site at **http://home.earthlink.net/~tenmtryl/ylrl**)

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Amateur Satellites

Edited by **Steve Ford, WB8IMY** • Managing Editor

Sputnik 40 (RS-17) Recordings & Analysis

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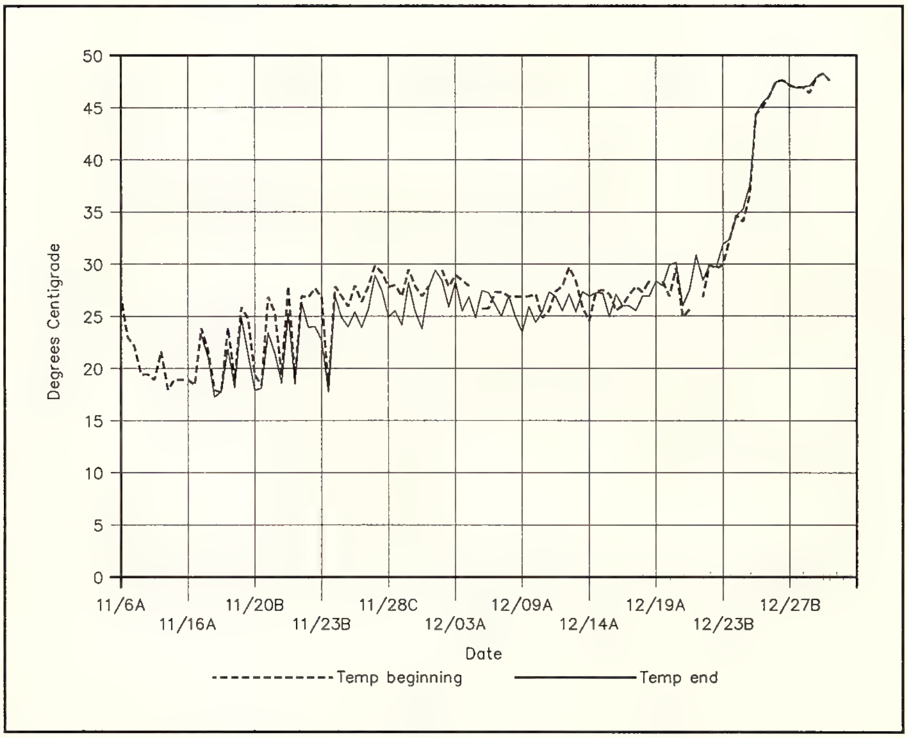

Figure 1—Internal temperature variations of Sputnik 40 as decoded between November 6 and December 29, 1997.

Sputnik 1 captured the world's attention in October 1957. Forty years later, Sputnik 40 (RS-17), a 1/3 scale replica of the original Sputnik, caused considerable excitement in the Amateur Radio world.

Sputnik 40 was the result of some creative thinking on the part of Russian high school students in the city of Naltchik. Together with French high school students on La Reunion Island, they decided to commemorate Sputnik 1 by constructing a "space worthy" replica, complete with a 2-meter FM downlink. The little satellite was then hand launched by Cosmonaut Pavel Vinogradov from the *Mir* space station on November 3, 1997. Hams throughout the world listened to the beeping telemetry signals of RS-17/Sputnik 40 (or "Spoutnik," as the French called it) during its brief 2-month lifespan. (As this column went to press, listeners were receiving their official Sputnik QSLs.—*Ed.*)

Taking Sputnik's Temperature

From the amateur news media we learned that the internal temperature of Sputnik 40 was being encoded with a "beeped" audio tone. Curious, we decided to record and analyze the signals. All we needed was a conversion chart to translate the beep frequencies to temperatures. Fortunately, we obtained the chart from Gerard Auvray, F6FAO.

To calculate the temperatures we had to devise a method of measuring the frequency of the audio beeps. First, a direct readout by a frequency counter was tried, but failed due to the intermittent nature of the beeps that occurred at the rate of approximately 84 beeps/minute with about a 20% duty cycle.

We tried to synchronize a locally generated audio signal with the beeps and measure the frequency of the local signal, but aural attempts to establish a zero beat did not support the desired accuracy. A third method compared the beep signals and the local audio on an oscilloscope. This proved to be very satisfactory. The classic Lissajous pattern of two frequencies allowed easy and steady synchronization of the two audio tones.

All the operator had to do was to observe the scope while adjusting the frequency vernier to obtain a Lissajous circle. After holding this pattern steady for one second or more, a reading of the frequency to within 1 Hz was made. It was surprising to observe that these circle patterns were easily discernible well down into the noise level.

Over 200 readings were noted, recording in particular frequencies near the beginning and end of each pass. The actual frequencies fell between 1250 and 1350 Hz. Recordings were made from November 6 through December 30, 1997. These frequencies were converted to temperature as shown in Figure 1.

Through December 20 the average temperatures were within a range of 20 to 30° C. A high reading of 48.3° C occurred on December 28. W8RVH's last recording was made on December 29 at 1314 UTC, yielding a temperature of 47.7° C. We noted at this time that Sputnik 40 was spending much more time in the sun as it paralleled the terminator. Also, as the lithium batteries approached the end of their lives, exothermic heating around the knee of the voltage curve may have contributed to an increase in temperature. The beeps ceased sometime between an observation made by Gerard, F6FAO, in Paris on December 30 at 0730 UTC and our attempt to receive signals in Ohio at 1213 UTC. Following passes were monitored, but no beeps were detected. Everyone concluded that Sputnik 40 became a "Silent Key" during this period, although the satellite is expected to spend a year or more in orbit before disintegrating in the Earth's atmosphere.

The Russian and French high school students who so successfully created this satellite are to be congratulated. Will American high school students be as innovative with a similar project in the near future?

Coming Conventions

*Edited by **Gail Iannone** • Convention Program Manager*

NEW ORLEANS INTERNATIONAL DX CONVENTION
August 14-15, 1998, New Orleans, LA

The New Orleans International DX Convention, sponsored by the New Orleans International DX Convention Committee, will be held at the Royal Sonesta Hotel, 300 Bourbon St, in the scenic and historic French Quarter of New Orleans. Doors are open Friday 1 to 4:30 PM, Saturday 9 AM to 1 PM. Features include DXpedition presentations, technical presentations, reports on ARRL DXCC desk and QSL card checking by Bill Kennamer, K5FUV, gala banquet (Saturday 7 PM, coat and tie, featured DX presentation). Talk-in on 147.36. Admission is $60 for hams in advance, $40 for nonhams in advance (through July 31); $70 for hams at the door, $50 for nonhams at the door; admission fees include banquet. Make checks payable to New Orleans International DX Convention and send to Michael Mayer, W5ZPA, 5836 Marcia Ave, New Orleans, LA 70124; **http://www.gnofn.org/~w5ru/DX_Cnex.htm**.

SOUTHWESTERN DIVISION CONVENTION
August 14-16, 1998, San Diego, CA

The Southwestern Division Convention, sponsored by the San Diego County AR Council, will be held at the Town and Country Hotel and Convention Center, 500 Hotel Circle North; I-8 at Hwy 163, Mission Valley. Doors are open Friday 1 to 8 PM, Saturday 7 AM to 10 PM, Sunday 8 AM to 2 PM. Features include flea market, forums and technical sessions, seminars (RF Safety, AMSAT), exhibits, Wouff Hong, VE sessions (Saturday, 9 AM to noon and 1 to 4 PM, no charge; reserve space 619-465-EXAM), T-hunt, hospitality rooms, banquet (Saturday eve, $35), free parking in hotel parking lot. Talk-in on 146.64. Admission is $12 in advance (by Aug 1), $15 at the door; under 17 free when accompanied by an adult. Make checks payable to SANDARC and send to Bob Boehme, W6RHV, 10340 Everell Pl, Santee, CA 92071; **rboehme@4dcomm.com**. Contact Sybil Allbright, W6GIC, 8658 Encino Ave, San Diego, CA 92123, 619-278-4284; **http://www.geocities.com/siliconvalley/lakes/8400/**.

ALABAMA SECTION CONVENTION
August 15-16, 1998, Huntsville

The Alabama Section Convention, sponsored by the Huntsville Hamfest Assn, will be held at the Von Braun Civic Center's South Hall, in downtown Huntsville. Doors are open Saturday and Sunday 9 AM to 5 PM. Features include flea market, manufacturers, dealer show, exhibitors, forums, DX banquet, hospitality rooms, VE sessions, ample parking. Talk-in on 146.94. Admission is $6, under 13 free. Tables are $30 (8 ft × 30 inches, includes one chair). Contact Don Tunstill, W4NO, 1215 Dale Dr SE, Huntsville, AL 35801, 205-534-7175, fax 205-534-5557, **dtunstil@advicom.net**; **http://www.hamfest.org/**.

1998

July 24-25
Oklahoma State, Oklahoma City*

July 24-26
Arizona State, Flagstaff*

July 31-August 1
Texas State, Austin*

August 1
Missouri State, Springfield*

August 1-2
Eastern Washington Section, Spokane*

September 12
W9DXCC, Rolling Meadows, IL

September 13
Hudson Division, Hicksville (LI), NY

September 19
Kentucky State, Louisville
Western New York Section, Hamburg (Buffalo)

September 19-20
Alaska State, Anchorage
New Mexico State, Rio Rancho
Roanoke Division, Virginia Beach, VA

September 27
Colorado Section, Longmont

October 3
Kansas State, Wichita

*** See July *QST* for details.**

COLORADO STATE CONVENTION
August 16, 1998, Golden

The Colorado State Convention, sponsored by the Denver RC, will be held at the Jefferson County Fairgrounds, 15200 W 6th Ave (Indiana St Exit); take 6th Ave W from I-25 to Indiana St, S to 6th Ave (Frontage Rd), W to Fairgrounds. Doors are open for setup 7:30 AM; public 8:30 AM to 2 PM. Features include vendors, forums (ARRL, technical), VE sessions. Talk-in on 145.49 (100 Hz). Admission is $4. Tables are $10 in advance (before Aug 2), $12 at the door, plus admission. Contact Guy Reed, W5GR, 29875 Troutdale Scenic Dr, Evergreen, CO 80439-7737; 303-674-5389.

NEW ENGLAND DIVISION CONVENTION
August 29-30, 1998, Boxboro, MA

The New England Division Convention, sponsored by FEMARA, will be held at the Holiday Inn Conference Center, Exit 28 off I-495. Doors are open Saturday 8 AM to 5 PM, Sunday 8 AM to 2 PM. Features include flea market, tailgating ($9 per space), exhibits, manufacturers, dealers, special event station, foxhunts, seminars, forums, demos, contests, VE sessions, buffet-style banquet (Saturday eve, 5:30 PM, show and dance, $26.95 in advance, $30 at the door, if tickets are available), Wouff Hong ceremony, free parking. Talk-in on 146.61. Admission is $6 in advance (by Aug 1), $8 at the door, under 16 free. Tables are $14 (6 ft × 3 ft). Make checks payable to FEMARA and send with SASE to Boxboro Registration, c/o Mel Cole, WZ1Q, Box 8, Prides Crossing, MA 01965. Contact Tony Penta, W1ABC, 88 Hill St, Topsfield, MA 01983-2404, 978-887-4989 or 617-248-6996; **http://www.boxboro.org**.

WEST VIRGINIA STATE CONVENTION
August 29, 1998, Weston

The West Virginia State Convention, sponsored by the WV State AR Council, will be held at the Jackson's Mill Conference Center; from S I-79 to Exit 99, W on US Rte 33 to 3rd stoplight, N on US Rte 19 to Jackson's Mill Rd; from N I-79 to Exit 105, W to Jane Lew, left turn at intersection, S on US Rte 19 to Jackson's Mill Rd. Doors are open 8 AM to 11 PM. Features include flea market, tailgating, forums (ARRL, DX), VE sessions. Talk-in on 145.39. Admission is $3. Contact Patrick Shea, N8MIN, Rte 4, Box 365F, Weston, WV 26452, 304-472-0001 or 304-269-1854; Dick Fowler, 304-623-9479; **wvsarc@qsl.net**; **http://qsl.net/wvsarc**.

Attention Hamfest and Convention Sponsors: ARRL HQ maintains a date register of scheduled events that may assist you in picking a suitable date for your event. You're encouraged to register your event with HQ as far in advance as your planning permits. Hamfest and convention approval procedures for ARRL sanction are separate and distinct from the date register. Registering dates with ARRL HQ doesn't constitute League sanction, nor does it guarantee there will not be a conflict with another established event in the same area.

We at ARRL HQ are not able to approve dates for sanctioned hamfests and conventions. For hamfests, this must be done by your division director. For conventions, approval must be made by your director and by the executive committee. Application forms can be obtained by writing to or calling the ARRL convention program manager, tel 860-594-0262.

Note: Sponsors of large gatherings should check with League HQ for an advisory on possible date conflicts before contracting for meeting space. Dates may be recorded at ARRL HQ for up to two years in advance.

Hamfest Calendar

*Edited by **Gail Iannone** • Convention Program Manager*

Attention: The deadline for receipt of items for this column is the **1st of the second month preceding publication date.** For example, your information must arrive at HQ by **August 1** to be listed in the **October** issue. Hamfest information is accurate as of our deadline; contact sponsor for possible late changes. For those who send in items for Hamfest Calendar and Coming Conventions: Postal regulations prohibit mention in *QST* of prizes or any kind of games of chance such as raffles or bingo.

(Abbreviations: *Spr* = Sponsor, *TI* = Talk-in frequency, *Adm* = Admission.)

Alabama (Huntsville)—Aug 15-16, Alabama Section Convention. See "Coming Conventions."

†California (Goleta/Santa Barbara)—Aug 30, 8 AM to 3 PM. *Spr:* Santa Barbara ARC. Elks Lodge, 150 Kellogg Ave; from S go N on Hwy 101 to Patterson Ave, right to Calle Real, W to Kellogg Ave, ½ block to Lodge; from N go S on Hwy 101 to

†ARRL Hamfest

Fairview Ave, N to Calle Real, E to Kellogg Ave. Vendors, ARRL booth, bookstore, VE sessions, contests, T-hunt, BBQ. *TI:* 146.79 (131.8 Hz), 223.92 (131.8 Hz). *Adm:* Free. Jim Allen, KF6HHX, 6266 Shamrock Ave, Goleta, CA 93117; 805-967-5403.

California (San Diego)—Aug 14-16, Southwestern Division Convention. See "Coming Conventions."

Colorado (Golden)—Aug 16, Colorado State Convention. See "Coming Conventions."

Colorado (Woodland Park)—Aug 29-30. Judy Thompson, KB0WGN, 719-836-0217.

Connecticut (Enfield)—Aug 21-23. Bruce Wood, N2LIV, 516-265-1015.

Idaho (Lewiston)—Jul 25. Doug Graham, KB7RKY, 208-743-2163.

†Illinois (Danville)—Aug 30, 8 AM to 2 PM. *Spr:* Vermilion County ARA. UAW Civic Center, I-74, Exit 215 N, follow signs. Free outside flea market, refreshments. *TI:* 146.82. *Adm:* $3 each or 2 for $5. Gary Denison, KA9SKS, 14704 E 2750 North Rd, Danville, IL 61834-5610, 217-759-7389; **gdenison@danville.net**.

Illinois (Woodstock)—Aug 30. Bob Grosse, N9KXG, 708-944-0500.

†Indiana (Lafayette)—Aug 16, 6 AM to 2:30 PM. *Spr:* Tippecanoe ARA. Tippecanoe Fairgrounds, State Rd 25 (Teal Rd), between 9th and 18th Sts. VE sessions. *TI:* 147.135, 443.775. *Adm:* $4. James Canarecci, WA9TGO, 944 Southland Dr, Lafayette, IN 47905; 765-474-6570.

Indiana (LaPorte)—Aug 29. Rich Dugger, WD9ARW, 219-326-6672.

Indiana (Warsaw)—Aug 22. Loren Melton, WB9OST, 219-858-9374.

†Iowa (Dubuque)—Aug 30, 8 AM to 2 PM. *Sprs:* Great River ARC, Iowa Antique RC and Historical Society, Tri-State Computer Users Group. Dubuque County Fairgrounds on Old Highway Rd, W of Dubuque. Hamfest/Radiofest/Computer Expo, flea market, tailgating, dealers, vendors, VE sessions (exams 10 AM; Carl Clark, N0KAX, 319-557-9149), camping, free parking, refreshments. *TI:* 147.24. *Adm:* advance $4, door $5, under 13 free. Tables: $8 (8 ft). Jerry Ehlers, W0SAT, Box 546, Dubuque, IA 52004-0546, 319-583-1016, **kb0lcj@mwci.net**; **http://grarc.mwci.net/**.

Kansas (Chanute)—Aug 15. Charlie Ward, WD0AKU, 316-431-6402.

†Kansas (Salina)—Aug 16, 8 AM to 3 PM. *Spr:* Central Kansas ARC. Bi-Centennial Center, Kenwood Park. Forums (ARRL, ARES, others), VE sessions (Saturday, Aug 15). *TI:* 147.03. *Adm:* advance $4.50, door $6. Ron Tremblay, WA0PSF, 112 N Douglas Dr, Salina, KS 67401, 785-827-8149; **tremblay@midusa.net**.

Kentucky (Cave City)—Sep 5. Larry Brumett, KN4IV, 502-651-2363.

†Louisiana (Bossier City)—Aug 8-9. *Spr:* Shreveport ARA. Civic Center, 620 Benton Rd. Forums, VE sessions, banquet, refreshments. *TI:* 145.11. *Adm:* $5. Alice Lewis, KC5JM, 275 Crestwood Circle, Benton, LA 71006; 318-965-1060.

Louisiana (New Orleans)—Aug 14-15, New Orleans International DX Convention. See "Coming Conventions."

Manitoba (Austin)—Aug 22. Dave Snydal, VE4XN, 204-728-2463.

†Massachusetts (Adams)—Aug 23; set up 6 AM; public 9 AM to 5 PM. *Spr:* Northern Berkshire ARC. Bowe Fairgrounds, Rte 8 into Adams, turn onto Newark St, Fairgrounds are on the right. Hamfest/Electronics Show, vendors ($10 per space, includes one admission), tailgating ($10 per 10 × 10-ft space), guest speaker George Caswell, W1ME, and his team from AMSAT, overnight camping. *TI:* 146.91. *Adm:* $3. Todd Shoff, N1XHR, 16 Hall Place, Pittsfield, MA 01201, 413-496-8054, **n1xhr@nobarc.com**; **http://www.nobarc.com/hamfest**.

Massachusetts (Boxboro)—Aug 29-30, New England Division Convention. See "Coming Conventions."

Massachusetts (Cambridge)—Aug 16. Nick Altenbernd, KA1MQX, 617-253-3776.

Minnesota (Waseca)—Aug 15. Lloyd Schlaak, N0VFV, 507-465-8619.

Missouri (St Charles)—Aug 23. Dirk Bremer, KC0BZV, 314-947-4220.

†Nebraska (Omaha)—Aug 23; set up 7 AM; public 8 AM to noon. *Spr:* AK-SAR-BEN ARC. Millard Social Hall, I-80 to Exit 440, ½ mile S on Hwy 50. Flea market, dealers, free parking, free coffee. *TI:* 146.94. *Adm:* Free. Tables: advance $5, door $7. Dave Kline, WJ0Z, 5055 S 87th St, Omaha, NE 68127, 402-592-4930, **dkline@unomaha.edu**; **http://www.qsl.net/k0usa/**.

New Jersey (Bridgewater)—Aug 22; set up 6 AM; public 8 AM to 1 PM. *Spr:* Somerset County ARS. Somerset County 4-H Center, Milltown Rd, off Rte. 202, S of Somerville Circle. Tailgating ($10 per space). *TI:* 448.175 (141.3 Hz), 147.135 (151.4 Hz). *Adm:* $5. Tables: $15 (power $5 extra, reservations required). SCARS, Box 742, Manville, NJ 08835, fax 732-873-0052; **scars@qsl.net**; **http://www.qsl.net/scars/**; Pat, N2CQM, 732-873-3394.

†New Jersey (Mullica Hill)—Aug 23. *Spr:* Gloucester County ARC. 4-H Fairgrounds; from NJ Turnpike take Exit 2, follow signs to Rte 322 E, right on Rte 45 S, follow to Rte 77 S, follow hamfest signs. VE sessions. *TI:* 147.18. *Adm:* advance $4, door $5. John Lloyd, KA2EZN, 411 Three Bridge Rd, Newfield, NJ 08344, 609-478-4738; **lloydj@algorithms.com**.

†New Jersey (Oakland)—Aug 15; set up 6 AM; public 8 AM to noon. *Spr:* Ramapo Mountain ARC. American Legion Hall, 65 Oak St, I-287 to Exit 58, US 202 S, turn right onto Oak St. Ham Radio and Computer Flea Market, vendors, tailgating ($8), refreshments. *TI:* 146.49, 446.175, 146.52. *Adm:* $4, nonham spouses and kids free. Tables: $10 (inside). Tony Cassera, N2KDZ, 72 Smokey Ridge Rd, Ringwood, NJ 07456, 973-839-3564, **acassera@intac.com**; **http://www.intac.com/~hansen/rmarc.htm**.

†New Mexico (Alamogordo)—Sep 5, 8 AM to 5 PM. *Spr:* Alamogordo ARC. Otero County Fairgrounds, Hwys 54/70 and Fairground Rd. Forums (ARRL, AMSAT, Roadrunner), VE sessions. *TI:* 146.8 (100 Hz). Jim Patton, N7IOM, 910 Post Ave, Alamogordo, NM 88310-7446, 505-439-8349; **n7iom@zianet.com**.

†New York (Buffalo)—Aug 23; vendors 5 AM, flea market and tailgaters 6 AM; public 7 AM to 3 PM. *Spr:* Lancaster ARC. Hearthstone Manor, 333 Dick Rd; I-90, Walden E Exit to Dick Rd, turn left. Hamfest/Computer Show, flea market, commercial exhibits, programs, tailgating, vendors, new equipment deals, used gear, computer bargains, VE sessions, refreshments. *TI:* 147.255. *Adm:* $6. Luke Calianno, N2GDU, 1105 Ransom Rd, Lancaster, NY 14086, 716-683-8880, **lcalianno@aol.com**; **http://hamgate1.sunyerie.edu/~larc/buffalofest**.

†New York (Chaffee)—Aug 22; set up 6 AM; public 8 AM. *Spr:* Pioneer Radio Operators Society. Manion Park, Grove St. Vendors. *TI:* 145.39. *Adm:* advance $3, door $4. Mike Buttino, N2LBV, 12109 Savage Rd, Sardinia, NY 14134; 716-496-8241.

New York (Ithaca)—Sep 5. Mike Collins, KF6EXF, 607-277-3484.

†New York (Westmoreland)—Aug 15, 8 AM to 3 PM. *Spr:* Rome Radio Club. Firemens Field, NY Thruway I-90 E or W, take Exit 32, follow signs to the field. Forums (ATV, SSTV, AMSAT, RTTY, ARRL, ARES, RACES, SKYWARN, American Red Cross, LARC Repeater Demo). *TI:* 146.88, 146.49. *Adm:* $4, under 13 free. Jack Roux, KB2TXR, 5398 Rome-Taberg Rd, Rome, NY 13440; 315-336-1391.

†New York (Yonkers)—Aug 23; set up 7:30 AM; public 9 AM to 3 PM. *Spr:* Yonkers ARC. Yonkers Municipal Parking Garage, Main St. Hamfest/Computerfest, commercial dealers, ARRL information, tune-up clinic, refreshments, unlimited free coffee. *TI:* 146.865, 440.15. *Adm:* $5, nonham spouses and under 12 free. Tables: advance $10 per space, door $14 per space, AC power available with preregistration. John Costa, WB2AUL, 195 Woodland Ave, Yonkers, NY 10703; 914-969-6548.

†New York (Yonkers)—Aug 30, 8 AM to 2 PM. *Spr:* Westchester Emergency Communications Assn. Yonkers Raceway, I-87, from S take Exit 2, from N take Exit 4. Radio and Electronics Hamfest, tailgating, new and used equipment and parts, major dealers, free parking, handicapped accessible, refreshments. *TI:* 147.06 (114.8 Hz). *Adm:* $6, under 14 free with adult admission. Thomas Raffaelli, WB2NHC, 544 Manhattan Ave, Thornwood, NY 10594, 914-741-6606; **http://www.weca.org**.

†North Carolina (Shelby)—Sep 5-6; 6 AM. *Spr:* Shelby ARC. Cleveland County Fairgrounds, on Hwy 74 Business. Forums, VE sessions. *TI:* 146.88. *Adm:* advance $4, door $5. June Melvin, WA4JNJ, 902 Henry St, Kings Mountain, NC 28086; 704-739-2583.

†Ohio (Warren)—Aug 16, 8 AM to 4 PM. *Spr:* Warren ARA. Kent State University, Trumbull Branch; Interstates 71, 80, 76, Rtes 11, 45, 5 to Warren; Rte 45 N, on right at City Limits. Forums, VE sessions. *TI:* 146.97, 448.0. *Adm:* $5. Charles Solinger, N8HRZ, 722 Scott Ave, Niles, OH 44446; 330-652-5028.

†Ohio (Wellington)—Jul 18, 8 AM to 3 PM. *Spr:* Northern Ohio ARS. Lorain County Fairgrounds. VE sessions, DXCC card checking. *TI:* 146.7. *Adm:* $5. John Schaaf, KC8AOX, Box 432, Elyria, OH 44036-0432; 216-696-5709.

Ontario (Carp)—Sep 5. Jim Cummings, VE3XJ, 613-446-1225.

†Pennsylvania (Homer City)—Aug 2, 8 AM to 2 PM. *Spr:* Indiana County ARC. Red Barn Sportsman Club, ½ mile off Indiana County Rte 119. *TI:* 146.91. *Adm:* $2. Gary Robison, K3SJX, 177 W Burrell St, Blairsville, PA 15717; 724-459-8941.

Pennsylvania (Lewistown)—Aug 8. Rich Yingling, WB3COB, 717-242-1882.

Pennsylvania (Matamoras)—Aug 9. Ray Henry, WY2D, 914-856-1733.

Pennsylvania (Uniontown)—Sep 5. Carl Chuprinko, WA3HQK, 304-594-3779.

†Tennessee (Lebanon)—Aug 30, 8 AM to 2 PM. *Spr:* Short Mountain Repeater Club. Cedars of Lebanon State Park, 8 miles W of Lebanon on US Rte 231. Huge tailgate party, refreshments. *TI:* 146.91. *Adm:* Free. Lee Hall, NY4T, 2526 Wellington Place, Murfreesboro, TN 37128, 615-849-9704, **ny4t@qsl.net**; **http://www.qsl.net/smrc**.

Vermont (Charlotte)—Aug 15. Ralph Stetson, KD1R, 802-878-6454.

†Washington (Longview)—Aug 15, 9 AM. *Spr:* Lower Columbia ARA. Cowlitz County Expo Center; take either Exit 36 or Exit 39 off I-5, go W, follow signs for the County Fairgrounds, now known as the Expo Center. *TI:* 147.26. *Adm:* $3. Bob Morehouse, KB7ADO, 2437 Allen St, Kelso, WA 98626, 360-425-6076; **KB7ADO@aol.com**.

West Virginia (Weston)—Aug 29, West Virginia State Convention. See "Coming Conventions."

†Wisconsin (Hayward)—Sep 5, 8 AM to 2 PM. *Spr:* Namekagon Valley Wireless Assn. National Guard Armory, Hwy 63 and W Main St. VE sessions. *TI:* 147.255 (110.09 Hz). *Adm:* advance $4, door $5. John Lindberg, N9QWH, 9316 E Evergreen Ave, Solon Springs, WI 54873, 715-378-2368, **jlindber@centuryinter.net**; **http://www.geocities.com/Heartland/Hills/7802/nvwa.html**.

Attention All Hamfest Committees!

Get official ARRL sanction for your event and receive special benefits such as free prizes, handouts, and other support. If you are an affiliated club, you are also entitled to receive a 10% commission on sales of League publications!

It's easy to become sanctioned. Contact the Convention and Hamfest Branch at ARRL Headquarters, 225 Main St, Newington, CT 06111. Or send e-mail to **giannone@arrl.org**.

New Products

PROLOG 98 FOR *WINDOWS*

◊ New from Datamatrix is *ProLog98* for *Windows*, a comprehensive database of more than 65,000 QSL routes that offers accuracy and the point-and-click convenience of *Windows 95*. The program works with all major CD-ROM call sign databases, and the built-in text editor lets users add and update data as necessary. Features include label printing; advanced search and sort functions; a DXCC prefix database; and more.

Price: $26 (*ProLog98*); $36 (six database updates); $58 (both). For more information, contact Datamatrix, 5560 Jackson Loop NE, Rio Rancho, NM 87124; tel 800-373-6564, **http://www.qth.com/prolog**.

Silent Keys

By Kathy Capodicasa, N1GZO

It is with deep regret that we record the passing of these amateurs:

W1APU, D. Herschel Bamford, Dover Foxcroft, ME
WA1ATX, Alfred J. Staples, Belfast, ME
W1AUQ, Clarence E. Hinchley, Melrose, MA
W1BQL, Charles P. Howe, Kennebunk, ME
WA1BZI, Harriett G. Edson, New Milford, CT
*K1DUG, Michael D. Mosbacher, North Ferrisburg, VT
W1FZL, Ernest W. Hauger, Winterport, ME
N1GND, Charles Staier, Wilton, ME
W1HCD, Paul M. L. Desilets, Portsmouth, NH
W1HLT, Howard P. Ross, Belfast, ME
WA1IBM, Leonard Prout, Winthrop, ME
KA1IWU, Harold C. Royal Jr, Brewer, ME
WA1PXD, John G. Cox, Bar Harbor, ME
W1RJR, John G. Ryan, Bangor, ME
*W1WBM, Maurice E. Hale Jr, Rochester, NH
W1YHW, Joseph W. Hermenzie, Westport, CT
W2CRZ, William J. Penney, Penney Farms, FL
WA2FXB, Sidney J. Lieberman, Woodbridge, NJ
WA2GEX, Jerome L. Propper, Tamarac, FL
K2GWT, Paul Modern, Webster, NY
KA2ICT, Virgil D. Braisland, Sidney, NY
WB2IDT, Daniel V. Mecca, Cheektowaga, NY
W2KPR, Cyrus D. Samuelson, Hackensack, NJ
W2OAC, Edward F. Earnshaw Jr, Paterson, NJ
W2ZBO, Joseph E. Snyder, Bradenton Beach, FL
WB3EZU, Robert H. Murray Jr, Chambersburg, PA
W3IBD, Elmer L. Gladson, Springfield, MO
WZ3P, William T. Kane, Carlsbad, CA
W3SFY, Lawrence L. Gasch, Forestville, MD
NT4AL, Alexander Frazer Jr, Fort Lauderdale, FL
W4BAS, Charles E. Pauck, Berea, KY
KF4DIE, Bennis G. Scott, Boaz, AL
N4HWU, Henry Staples, Statesboro, GA
K4HXZ, John F. Wyman, Cedar Mountain, NC
N4IXH, Curtis M. Lee, Fort Walton Beach, FL
KE4JOV, Harley A. Myers, Springfield, VA
AC4LL, Joseph A. Gagliano, Chester, VA
N4MII, Harding Mattera, Roanoke, VA
W4MWP, Richard M. Bellows, Sarasota, FL
KF4NSY, Helen L. French, Dyersburg, TN
W4PC, Neil Spencer, Largo, FL
WA4RMY, John A. Klumker Sr, Montgomery, AL
N4SBE, Carmen Leone, Sebastian, FL
K4UBR, Gerald J. Green, Middleburg, FL
N5CB, Charles A. Brown, Leesville, LA
N5CTQ, Charles G. Overton Jr, Albuquerque, NM
KC5DIX, Obie J. Worthen, Grants, NM
N5DUT, C. L. Johnson, Albuquerque, NM
*K5ER, Edwin R. Ranson III, Port Townsend, WA
W5FAG, J. H. Harrell Jr, Albuquerque, NM
WD5FCF, Gary R. Glover, Hobbs, NM
KF5FI, Walter H. Wright, Santa Fe, NM
*W5HAQ, Robert E. Wick, Houston, TX
KA5HCX, Raymond P. Redwood, Austin, TX
W5HUI, Charles F. McFerren, Kaw City, OK
*KD5IU, Gordon Becker, Rosebud, TX
W5JFA, Eugine F. Channell, Poyen, AR
W5JJA, Vernon Robertson, Columbus, MS
KA5JWQ, Christophe Mosley, Oklahoma City, OK
W5NGX, John R. Bell, Levelland, TX
W5NU, Ernest E. Pike, Savoy, TX
KC5QYZ, Raymond Mungiu, Rio Rancho, NM
K5RKX, Robert B. Kotal, Warrenton, NC
K5ROT, Byron E. Hutchison, Albuquerque, NM
W5RSH, Clark A. Chamberlain, Franklin, NC
W5SQJ, Jess W. Speer, Norman, OK
K5XL, J. R. Derryberry, Albuquerque, NM
N6CBI, Ralph E. Farmer, Santa Maria, CA
WA6DXP, J. Quirantes, San Jose, CA
AB6EU, James McCauley, Glen Ellen, CA
WB6GUX, Sherman E. Brazil, Knoxville, TN
N6IL, Grady Howard, San Diego, CA
WA6LLZ, Will R. Hilbrink, Los Gatos, CA
W6MDW, Paul W. Erickson, San Francisco, CA
WO6N, Wallace D. Westfall, Canby, OR
WB6PTW, Clark Jackson, Miramonte, CA
KB6QH, Robert A. Gregory, San Diego, CA
**W6QL, Iris Colvin, Richmond, CA
NW6Q, Robert Wieland, Santa Cruz, CA
K6QW, Carlyle R. Norman, Novato, CA
KJ6SR, Edwin Erman, Lodi, CA
KB6TV, James W. Bass, West Covina, CA
W6YJN, John J. Schocki, Reno, NV
W6ZZZ, Jordan A. Engberg, Redlands, CA
K7AHA, J. E. Rasmussen, Yerington, NV
W7BYB, Charles W. Hash, Mcminnville, OR
WA7DNM, Elmer L. Falconburg, Jerome, ID
KA7EAT, Sam Dorning, Waldport, OR
AB7G, Claude H. Anderson, Seattle, WA
KC7GY, John H. Hogan, White Salmon, WA
WB7NLW, Adam D. Goettl, Phoenix, AZ
KA7NPT, Connie J. Vogel, Worden, MT
K7NYA, Carroll W. Harris, Lakewood, WA
*K7UGA, Barry Goldwater, Scottsdale, AZ
W8ALI, Max G. Bauer, Scottsdale, AZ
W8BCK, John W. Brantner, Columbus, OH
WA8CPB, Albert W. Maddux, Delphos, OH
AA8DL, Eugene Hutchins, Norwalk, OH
K8JHK, Earl E. Noyes, Midland, MI
W8KCK, Eugene A. Potter, Barberton, OH
K8KJX, Ellsworth E. Wiedman, Howell, MI
AA8L, Robert P. Clifford, Saint Clair, MI
W8LAX, Hubert V. Wolfe, Tipp City, OH
WB8NWK, Dr Roland Toth, Dayton, OH
K8NZW, Louis E. Engler, Columbus, OH
W8OWD, Oscar A. Tinker, Van Wert, OH
KE8RJ, Vern Morningstar, Owosso, MI
K8VAI, Clifford S. Cooper Jr, Parkersburg, WV
WA8VFS, Howard E. Thom, Arcadia, FL
K8YJZ, Donald A. Paradise, Riverview, MI
N9AEF, William R. Davis, Portage, IN
K9CJK, James E. Buth, Crawfordville, FL
W9CNQ, Norman W. Matthys, Park Ridge, IL
W9CWN, Clyde Burkhead, Dunnellon, FL
WB9ELT, Lawrence A. Swanson, Galva, IL
K9FVL, Charles G. Martin, Camden, IN
KA9HQW, Robert W. Pulliam, East Troy, WI
KB9IRA, Keith E. Martin, Naperville, IL
W9JGB, Gerald D. Smith, Bourbonnais, IL
WA9JNC, Harold C. Ludeker, Milan, IN
N9KUZ, David R. Babb, Belvidere, IL
W9MGV, Eldon E. Wood, Fort Wayne, IN
W9PSD, Harold L. Pyle, Greenwood, IN
W9PXS, John B. Fitzpatrick, Dwight, IL
W9TT, William J. Christman, Barrington, IL
WA9UPE, Daniel M. Borkon, Cedarburg, WI
W0APL, Edward E. Fredrickson, Lead, SD
W0EYL, Glen F. Peterson, Minneapolis, MN
KC0NA, Charles V. Peterson, Deerwood, MN
*W0NC, W. P. Armstrong, Tampa, FL
WB0OQP, Harry M. Benjamin Jr, Sioux Falls, SD
WB0WFG, David B. Edwards, Miles City, MT
*W0YDV, John W. Ferrel, Omaha, NE
VE3BIW, Dick St Louis, Windsor, Canada
5X1F, Samuel Y. Berhan, Kampala, Uganda

*Life Member, ARRL

**Charter Life Member, ARRL

‡Call sign has been re-issued through the vanity call sign program.

Note: Silent Key reports must confirm the death by one of the following means: a letter or note from a family member, a copy of a newspaper obituary notice, a copy of the death certificate, or a letter from the family lawyer or the executor. Please be sure to include the amateur's name, address and call sign. Allow several months for the listing to appear in this column.

Many hams remember a Silent Key with a memorial contribution to the ARRL Foundation. If you wish to make a contribution in a friend or relative's memory, you can designate it for an existing youth scholarship, the Jesse A. Bieberman Meritorious Membership Fund, the Victor C. Clark Youth Incentive Program Fund, or the General Fund. Contributions to the Foundation are tax-deductible to the extent permitted under current tax law. Our address is: The ARRL Foundation Inc, 225 Main St, Newington, CT 06111.

75, 50 and 25 Years Ago

August 1923

◊ Clyde Darr, 8ZZ's, cover shows the Commerce Department's Radio Inspector sending Morse via a mechanical code machine to a bug-eyed applicant, with the caption, "10 Words per." The editorial addresses the new situation of hams being licensed to "roam at will thruout our band," rather than the previous situation of operating at the wavelength(s) specified on each ham's license, going on to say that "...we need a method for rapidly and accurately shifting the wave length of a tube transmitter to any point within its authorized band."

Big news is presented in the lead article, "Passing of the Pacific," wherein it is reported that the "kangaroo [has been] outclassed as American amateur radio signals leap to [the] antipodes." US ham signals were heard in both Australia and New Zealand, some of them strong enough to be heard on the loud speaker. Photos in the article show some of the US stations' equipment and antennas. "The New Amateur Regulations" further discusses the impact of the new regs that allow operation on any frequency within the ham band. An article by K. B. Warner announces "The Departure of 'WNP'" with the League's Don Mix, 1TS, as the ship operator. The first ham contact was with 1CKP, who received a thank-you message from the crew for a gift of silverware. Part II of F. S. Dettenbaugh's article on "Electric Filters" presents extensive design information. The first installment of the "Final Report on the Fading Tests," which were run cooperatively by the ARRL and the Bureau of Standards, is published, reporting on the nature of radio signal fading.

August 1948

◊ The cover photo shows the rig described in the lead article, "807s in Push-Pull," by Don Mix, W1TS. The editorial covers two topics: "'Daddy, Buy Me That'" discusses the unfortunate trend of current hams to wait for manufacturers to bring out equipment with new circuits and features, rather than the hams developing and building it themselves. One such remark being heard is that "...s.s.b. seems to represent a technique that one might keep an eye on, because perhaps it presents some interesting possibilities, but it is hardly ready for amateur radio until some manufacturer brings out a complete exciter unit." The second editorial topic, "The Importance of C.W.," discusses two new requests the League has put on file with the FCC to reflect the importance of Morse skills. The editorial notes that "Now it is being increasingly observed that a big percentage of the new fellows coming into amateur radio regard knowledge of the code purely as a necessary nuisance and master it reluctantly in just sufficient degree to obtain a license."

Don Mix's article on the push-pull 807 amplifier describes a shielded, stabilized amplifier for the lower-frequency HF bands that will minimize TVI. T. A. Githens, W9AEH, tells how to reduce QRM in "A Super-Selective C.W. Receiver" through the use of "a 72-Kc. I.F. amplifier." George Foster, W9TOO, describes "The 'Hammock' Beam," a fixed-azimuth wire beam for 14 Mc. that features switchable reversing directionality. "The Dash Master" describes the "semielectronic key" that author Theodore Gotisar, W6TZK, uses to add automatic dashes to his bug. Ed Tilton, W1DHQ, tells how to get "High Power on 220 Mc." with an 832A p-p driver into a p-p final using a pair of 4-65A tubes. The ads in this issue reflect the still-low price of military surplus: unused ARC-5 transmitters, $5.95; 807 tubes, $1.15, and 1625 tubes, 49 cents; a reversible electric motor suitable for rotating small beams, $7.45...."

August 1973

◊ The cover photo shows W3ZKI potting the Oscar 6 repeater prior to launch. The editorial tells about the new threat to 220 MHz—that of possibly losing a 1 MHz segment to CB.

"The Micromountaineer," by Wes Hayward, W7ZOI, describes his teeny 40-meter CW transceiver. Robert Lewis, K7YBF, tells how to approach the building of new circuitry into a box provided by older gear, in "Recycling Obsolete Gear." James Garrett, WB4VVF, describes "The WB4VVF Accu-Keyer." Associate Technical Editor Jerry Hall, K1PLP, tells about "Bearing and Distance Calculations by Sleight of Hand." Fred Cupp, W2DUC, and Chuck Oneske, K2YCO, describe "The Rochester VHF Converters—A Club Project that Paid Off." Jan King, W3GEY, provides details on "The Sixth Amateur Satellite," part of which was pictured on the cover. Prose Walker, W4BW, Chief of the FCC's Amateur & Citizens Radio Division, presents a searching look into present-day trends in amateur radio and what they might portend for the future, in "Planning for the Future."—*Al Brogdon, W1AB*

By **Billy Lunt, KR1R**
Contest Manager

1998 ARRL RTTY Roundup Results

You could feel the tension in the air as digital operators from around the world anxiously awaited the start of the tenth annual RTTY Roundup. This is one operating event that the digital crowd looks forward to each year. There is nothing better than starting the new year by participating in your favorite contest. Ron, K5DJ, sums it up nicely, "This year's roundup was awesome from the starting gun until the end! The RTTY Roundup is the king of all contests!"

Propagation is the key to any successful contest. Without at least a couple of good openings, a contest can be on the boring side. This year, band conditions were improved by the early stirrings of Cycle 23. With an additional 30 or so points in solar flux levels, long-haul openings were commonplace on 20 meters which, as usual, was the backbone for serious competitive efforts. But 15 meters was probably the big surprise this year, with openings that supplied almost as many contacts as 20 meters. As darkness closed in, the activity shifted to 40 and 80 meters.

Despite the foul weather that January brings—ice, snow, rain, and wind—participation is always great in the RTTY Roundup. We received 452 entries in this year's contest. Due to the positive publicity we get for this contest from the participants, you can count on attracting a fair amount of first timers. One of these newcomers was Egbert, ON4CAS. He was quite excited to work a new country, "This was my very first ARRL RTTY Roundup, and I was able to work a new country—New Caledonia."

Digital contests become truly enjoyable if you have only one computer to do everything. We noticed that most participants who used a computer were using the WF1B software package. Hats off to Ray for all his hard work and effort in the software department. He's no slouch when it comes to operating either, as the WF1B multioperator effort in this year's contest netted his crew a second place finish among the high power multiops, just behind the eventual winner.

One problem observed here is that some versions of *RTTY* by WF1B don't count the multipliers correctly. If you're using version 3.0 or 3.2A, your multipliers should be checked before submitting logs. These versions were noted as not giving credit for a lot of multipliers! It's amazing the number of contesters who are not even looking at their calculated scores. The Contest Branch had to recalculate the multipliers for quite a few contesters who used these versions of the software. It's to your benefit to compare the QSOs and multipliers on your summary sheet against the log itself before submission.

Max, IK1GPG, takes a well-deserved break during the RTTY Roundup. Pictured with Betty, IK1QFM.

Top Ten Scores

Single Operator

W/VE—Low Power	
AA5AU	130,020
KA4RRU	106,275
WW2R	103,929
WT4I	99,200
VA3MM	91,164
KD5ZM	90,524
KN6DV	88,452
N1RCT	87,255
W1TY	87,026
K4ZAM	84,630

W/VE—High Power	
K5DJ	182,390
K3MM	175,200
W7MMQ	128,010
N8PR	126,996
KK5OQ	95,200
W7NN	88,976
W7TI	88,412
K0KO	86,142
N9NCX	85,280
N2DL	80,244

DX—Low Power	
PT2BW	76,501
EU1AZ	53,184
EA5BHK	44,814
UN5PR	43,290
IV3FSG	41,538
HA5BSW	40,950
P40X (NX9O,op)	39,864
J8/DF2SS	31,284
XE3/I5JHW	26,950
KP4VP	21,900

DX—High Power	
CT3BX	97,060
CT1AOZ	89,688
UT0I	87,156
9A8A	79,501
CE8ABF	76,529
DJ5JK	66,528
OH1AF (OH1MDR,op)	66,126
HA2SX	62,274
EA2IA	61,110
YL8M (YL2KL,op)	60,424

Multioperator

W/VE—Low Power	
K2DS	98,333
N1JEB	63,308
KG0QG	51,840
N8LRG	44,238
W5VZF	41,194
N3IXR	34,602
W0EEE	18,414
WA4QDM	15,170
N7IZM	14,880
K7UB	9,898

W/VE—High Power	
W0SD	124,232
WF1B	121,980
W7RY	117,327
W4MR	105,561
N8NR	104,095
NO2T	70,300
W4CV	66,048
N0ISE	60,060
VE3FJB	57,960
K4WW	57,950

DX—Low Power	
IK7YUA	20,664
VP2E/NM7N	15,535
SP5ZCC	13,910
KL7IWC	12,540
LZ1MC	3,811

DX—High Power	
S55A	25,520
SN1I	22,330

Score Records

Last year, we were quite excited when 27 division records were broken, but this year we blew right past that high-water mark—three new overall score records and 33 division records! That's a clue that propagation is definitely improving. During this year's contest, low and high power single-operator records were broken, as well as the multioperator low-power record. AA5AU set the new single-operator low-power record at 130,020 points, while K5DJ set the single-operator high-power record at 182,390 points. K2DS goes into the multioperator low-power record book with 98,333 points. Also 33 new division records were set: Single-operator low-power—W1TY, N9CK, AA5AU, WB8YJF, N2FF, N1RCT, N6NT, KA4RRU, WT4I, KN6DV, WW2R, VA3MM; Single-operator high-power—K3MM, N9NCX, K0KO, KK5OQ, W7MMQ, N8PR, K5DJ; Multioperator low-power—N3IXR, W5VZF, N8LRG, K2DS, KG0QG, N1JEB, N7IZM; Multioperator high-power—W0SD, N8NR, NO2T, KO0Z, WF1B, W7RY, W4MR. Not all winners set new records, so be sure to look over the score boxes for the rest of the winners. Congratulations to all the new record holders, and winners!

You don't have to set a new record to have fun. That's what is nice about contesting—there's something for everyone. During contests, you can find stations from around the world. When the bands are full like this, it's easier to work that last state for your Worked All States, or work a new country toward your DXCC. Local competition is very popular among the "little guns." Even the casual operator tuning across the bands finds the fun and excitement of fast-paced competition.

While you're looking over the contest results is the perfect time to start planning for next year's contest. Check out your antennas and take a look at your band-by-band strategy—there's always room for

Region Leaders

Boxes list call sign, score, class (S = single operator, M = multioperator), and power (A = low power, B = high power).

Northeast Region

(New England, Hudson and Atlantic Divisions; Maritime and Quebec Sections)

N1RCT	87,255	S	A
W1TY	87,026	S	A
WA6ILT/1	51,417	S	A
K3MM	175,200	S	B
N2DL	80,244	S	B
ND8L/3	76,398	S	B
K2DS	98,333	M	A
N1JEB	63,308	M	A
N3IXR	34,602	M	A
WF1B	121,980	M	B
NO2T	70,300	M	B

Southeast Region

(Delta, Roanoke and Southeastern Divisions)

AA5AU	130,020	S	A
KA4RRU	106,275	S	A
WT4I	99,200	S	A
N8PR	126,996	S	B
KK5OQ	95,200	S	B
W4WX	69,700	S	B
W5VZF	41,194	M	A
WA4QDM	15,170	M	A
W4MR	105,561	M	B
W4CV	66,048	M	B

Central Region

(Central and Great Lakes Divisions; Ontario Section)

VA3MM	91,164	S	A
N9CK	63,984	S	A
WB8YJF	61,544	S	A
N9NCX	85,280	S	B
AB8K	55,182	S	B
W9IL	53,568	S	B
N8LRG	44,238	M	A
VE3AA	7,000	M	A
VA3HL	6,916	M	A
N8NR	104,095	M	B
VE3FJB	57,960	M	B
K4WW	57,950	M	B

Midwest Region

(Dakota, Midwest, Rocky Mountain and West Gulf Divisions; Manitoba and Saskatchewan Sections)

WW2R	103,929	S	A
K0BX	60,900	S	A
N5XUS	47,440	S	A
K5DJ	182,390	S	B
K0KO	86,142	S	B
WB0O	64,614	S	B
KG0QG	51,840	M	A
W0EEE	18,414	M	A
W0SD	124,232	M	B
N0ISE	60,060	M	B
KO0Z	32,984	M	B

West Coast Region

(Pacific, Northwestern and Southwestern Divisions; Alberta, British Columbia and NWT/Yukon Sections)

KN6DV	88,452	S	A
N6NT	70,434	S	A
KJ7TH	48,370	S	A
W7MMQ	128,010	S	B
W7NN	88,976	S	B
W7TI	88,412	S	B
N7IZM	14,880	M	A
W7RY	117,327	M	B
K6CT	35,346	M	B

improvement. Don't wait till the last minute. See you January 2-3, 1999 for the next ARRL RTTY Roundup.

SOAPBOX

I was able to improve my score from last year by 40% due to better conditions, activity, and strategy. It will be much better if the higher bands open next year (DJ5JK). The conditions on 15 meters were pretty good. I was able to reach a couple of USA stations (DL7VOG). Always very enjoyable! Propagation wasn't too bad, however I hope it will be better next year (IK6CAC). Thanks for a nice contest. Nice conditions in the beginning, on 80 meters, and soon after on 15 meters and also 40 meters (SM4RGD). Thank you for a very nice contest. We are rather new on RTTY and don't have a lot of experience, but we like this kind of ham radio very much (SP5ZCC). The band conditions were much better this year (KL7/KG5EG). Had a ball! Fifteen meters was really hot for me this year (NH6XM). Activity seemed higher than last year and band conditions were certainly better. I was able to pick up all 48 continental states, but missed KL7 and KH6 (WA6ILT/1). This was my first contest and I had a great time (N1RDN)! Not sure why, but it seems I had to work harder for contacts this year; I had fun anyway (W1LEE). Had a great time operating! No frequency conflicts with other RTTY contesters (WF1B). This was the first contest in which we worked all states during this contest including KL7 and KH6 (N1JEB). I was surprised I was able to run as much as I did on low power. When you run, you have to think big, it works (N2FF). Best score ever, but would not have been possible without the WF1B software; had a ball (K3WNI)! It was nice to see the bands in better shape than in previous years (W3WKR). What a great time! No interfering, no haggling, simply a great bunch of contesters. Thanks to all (N3IXR)! Had a blast looking forward to the next one (KA4RRU)! Great contest! Participation is really up (KD5ZM). My best roundup yet! Moving to a new location improved my 80-meter score (AC5DK). It was tremendous fun (KR6E)! Amazing how much fun one can have with just 100 W into a pair of ground-mounted vertical antennas (AA6TY). It's hard to believe 40 meters was my best band. Fifteen was strange, I could hear W1s working W7s, but I couldn't work either side (K8SIA). Good activity, both domestic and DX, but not much in the way of variety of DX (N8NR). Last year the flu, this year an ice storm... I have to find another hobby (KF8KW). Forty meters really held up well throughout the entire contest (N9THC). This was my first real contest in almost 20 years. Unfortunately, due to a gremlin in the shack affecting some equipment I was limited to 30 W on 20 meters (WD9EKA). I really enjoyed the contest. Everyone exhibited old-fashioned manners. What a pleasant change from many of the other 'tests I've been in in the last 10 years (N0ISL). Had lots of fun and that's what it's all about (VE3WZ)!

Scores

Scores are listed by DXCC Countries and ARRL/RAC Sections. Line scores list call sign, score, QSOs, multipliers, hours, and power (A = low power, B = high power). Division and continental leaders are listed in bold.

Asia					
Kyrgyzstan					
EX2M	12,896	248	52	24	B
Tajikistan					
EY8CQ	3,180	106	30	24	B
Japan					
JA3DLE/1	10,032	176	57	9	A
JA1WSK	8,241	123	67	24	A
JA2BY	6,344	104	61	24	A
JA1SJV	2,146	58	37	24	A
JR1KSK	1,624	58	28	24	A
JA7KM	143	13	11	22	A
JF3PNQ	16,056	223	72	24	B
Asiatic Russia					
RA0FF	13,490	190	71	24	A
Kazakhstan					
UN5PR	43,290	555	78	24	A
Europe					
Croatia					
9A1CEI	651	31	21	24	A
9A3SM	220	20	11	24	A
9A8A	79,501	743	107	24	B
Portugal					
CT1BNW	2,052	57	36	24	A
CT3BX	97,060	844	115	24	B
CT1AOZ	89,688	808	111	22	B
CT4DX	5,005	91	55	24	B
Fed. Rep. of Germany					
DL5ZB	14,137	211	67	24	A
DL8SDC	10,269	163	63	24	A
DJ5JK	66,528	616	108	24	B
DJ6QT	58,194	549	106	24	B
DL7VOG	28,170	313	90	24	B
Spain					
EA5BHK	44,814	462	97	24	A
EA4CI	15,867	369	43	24	A
EA2BNU	10,688	167	64	24	A
EA1AHA	5,668	109	52	24	A
EA4BNQ	4,600	100	46	24	A
EA1BAF	2,592	72	36	24	A
EA2IA	61,110	630	97	24	B
Belarus					
EU1AZ	53,184	554	96	24	A
France					
F6AUS	15,862	206	77	24	A
F5YJ	5,405	115	47	24	A
England					
G0LII	6,655	121	55	24	A
Wales					
GW4KHQ	20,448	288	71	24	A
Hungary					
HA5BSW	40,950	455	90	24	A
HA2SX	62,274	582	107	24	B
HA3LI	13,158	306	43	24	B
Italy					
IV3FSG	41,538	483	86	24	A
IK4WMH	13,650	210	65	24	A
I2HWI	13,570	230	59	14	A
IK6CAC	13,298	218	61	24	A
IK2XRW	12,726	202	63	24	A
I0KHP	12,210	185	66	18	A
IK1GPG	11,088	168	66	24	A
IK2AUK	4,664	106	44	24	A
IK2UVR	4,620	84	55	9	A
IK2XZB	4,050	90	45	24	A
IT9STX	3,939	101	39	24	A
IK7RVY	3,927	77	51	24	A
I8BVW	3,239	79	41	24	A
IV3KSE	2,340	65	36	24	A
IK4QIB	2,109	57	37	24	A
IT9SMU	1,440	45	32	24	A
IZ0AEH	989	43	23	24	A
IK4YNR	256	16	16	24	A
I1COB	52,477	541	97	7	B
IK2GWH	9,558	162	59	24	B
IK7YUE	2,074	61	34	24	B
IT9JOF	1,785	51	35	24	B
IK7YUA (+IK7XIV)	20,664	328	63	24	A
Norway					
LA5TFA	5,177	167	31	24	A
LA7AJ	16,974	246	69	24	B
Bulgaria					
LZ2AU	18,900	300	63	24	A
LZ3RN	204	17	12	24	A
LZ8A	57,222	578	99	24	B
LZ1MC (+LZ1DQ)	3,811	103	37	24	A
Finland					
OH3KOK	6,536	152	43	24	A
OH5KUY	540	27	20	24	A
OH1AF (OH1MDR,op)	66,126	642	103	24	B
OH2LU	28,560	357	80	17	B
Czech Republic					
OK2DB	18,648	252	74	24	A
OK2PAD	12,663	201	63	24	A
OK1URY	9,720	180	54	24	A
OK2VWB	9,450	150	63	24	A
OK1AXB	5,202	102	51	24	A
OK2BJT	2,470	65	38	24	A
OK2PCL	2,400	60	40	24	A
OK2BMC	1,888	59	32	8	A
OK1CZ	651	31	21	24	A
OK1CM	54,900	549	100	24	B
OK2BXW	13,286	182	73	24	B
OK2SG	11,661	169	69	24	B
Slovakia					
OM3TA	13,568	212	64	24	A
OM3PR	2,332	53	44	24	A
Belgium					
ON6CR	8,892	156	57	24	A
ON4CAS	8,505	135	63	24	A
Denmark					
OZ9AG	1,551	47	33	24	A
OZ7XE	1,750	70	25	24	B
Netherlands					
PA3DHR	22,630	310	73	24	B
PA0EHF	1,610	46	35	24	B
Slovenia					
S57KM	9,350	187	50	24	A

S53MJ	51,360	535	96	24	B
S55A (+S57NTW)	25,520	319	80	24	B

Sweden

SM7BHM	21,216	272	78	24	A
SL4ZYC	5,031	129	39	24	A
SM7ATL	2,112	66	32	24	A
SM3DXC	1,500	50	30	24	A
SM4RLD	459	27	17	24	A
SM4RGD	22,100	325	68	24	B
SM5EIT	1,050	50	21	24	B

Poland

SP4TXI	19,950	266	75	24	A
SP9LKS	9,780	163	60	24	A
SP2EIW	6,148	116	53	24	A
SP3RBT	5,720	110	52	24	A
SP2FAV	5,358	114	47	24	A
SP7FQI	5,175	115	45	24	A
SP4BOS	2,201	71	31	24	A
SP2UUU	2,040	60	34	24	A
SP8FHJ	1,400	50	28	24	A
SP6FBD	864	32	27	24	A
SP3XR	6,517	133	49	24	B
SP5GRM	4,018	98	41	24	B
SP1MHV	130	13	10	24	B
SP5ZCC (SP5UAF,SQ5BPM,SQ5BPT, SQ5EB7,SQ5EBL,SQ5HAB,SQ5V7B, 325AAN,ops)	13,910	214	65	23	A
SN1I (SP1MHV,SP10304KO,ops)	22,330	319	70	24	B

European Russia

UA6LP	7,536	157	48	24	A

Ukraine

UT0I	87,156	807	108	24	B

Latvia

YL2KF	4,264	104	41	24	A
YL8M (YL2KL,op)	60,424	664	91	24	B

Yugoslavia

YU7AE	12,540	220	57	24	A
YU7YG	46,035	495	93	24	B

North America

St. Vincent

J8/DF2SS	31,284	396	79	24	A

Alaska

KL7/KG5EG	21,300	355	60	24	A
KL7WP	8,772	172	51	13	A
KL7IWC (+WL7CQA)	12,540	209	60	24	A

Puerto Rico

KP4VP	21,900	300	73	24	A

Anguilla

VP2E/NM7N (+AI4K)	15,535	239	65	22	A

Mexico

XE3/I5JHW	26,950	350	77	24	A
XE2DV	8,100	162	50	24	A
XE1J	23,100	300	77	12	B

Oceania

New Caledonia

FK8VHN	21,243	291	73	24	A

Hawaii

NH6XM	17,670	285	62	24	A

Australia

VK3EBP	2,646	63	42	20	A

South America

Chile

CE8ABF	76,529	743	103	24	B

Argentina

LU6AUM	1,950	75	26	24	A

Aruba

P40X (NX9O,op)	39,864	453	88	24	A

Brazil

PT2BW	76,501	677	113	24	A

South Shetland Islands

LZ0A (LZ2UU,op)	23,100	220	105	24	B

Venezuela

YV1DIG	54,000	540	100	24	B

United Sates

1

Connecticut

WA1EHK	12,936	196	66	19	A
KA1IXG	7,728	138	56	24	A
WB8IMY/1	4,275	95	45	5	A
N1HPF	3,995	85	47	24	A
WR1B	1,134	42	27	4	A

Eastern Massachusetts

WA6ILT/1	51,417	591	87	24	A
W1TE	38,857	427	91	24	A
W1DEA	38,857	427	91	24	A
WZ1Q	34,744	404	86	24	A
WU1F	11,328	177	64	10	A
AE1M	4,662	126	37	24	A
N1RDN	2,960	74	40	24	A
W1RY	34,572	402	86	24	B

Maine

N1RCT	87,255	831	105	24	A
N1AFC	1,887	51	37	24	A
W1LEE	9,135	145	63	15	B

New Hampshire

K1PTF	37,474	457	82	24	A
WW1Y	28,002	359	78	24	A
KA1O	18,288	254	72	24	A

Rhode Island

WF1B (+KO1X)	121,980	1070	114	24	B

Vermont

N1FKR	7,395	145	51	24	A
W1MAG	52,724	538	98	24	B
W1CX	36,326	443	82	24	B

Western Massachusetts

W1HFN	14,472	201	72	24	A
W1BYH	14,364	252	57	9	A
WN1E	12,480	192	65	24	A
WB1HGL	10,324	178	58	14	A
K5ZD	74,152	713	104	24	B
N1JEB (+N1JIT)	63,308	646	98	24	A

2

Eastern New York

WJ2RM	32,960	412	80	24	A
AA2QR	5,830	106	55	6	A
N2DL	80,244	743	108	24	B
KB2DJJ	2,640	66	40	5	B
K2DS (+WA2JQK)	98,333	919	107	24	A

NYC-Long Island

N2FF	46,084	562	82	22	A
WY2E	30,030	385	78	16	A
N2AUK	27,004	314	86	19	A
WA2CNV	8,493	149	57	24	A
N2LEB	8,062	139	58	24	A
AA2WM	304	19	16	6	A
WB2KHO (+KB2NOW)	8,802	163	54	24	A

Northern New Jersey

N2QLQ	15,368	226	68	24	A
KF2QS	15,050	215	70	23	A
ND2K	7,137	117	61	7	A
KO2FB	2,600	65	40	24	A
W2HCA	3,960	90	44	6	B
NO2T	70,300	703	100	22	B

Southern New Jersey

KC2SZ	7,889	161	49	24	A

Western New York

W1TY	87,026	821	106	24	A
WA2EYA	19,028	268	71	15	A
N2ZDL	9,940	142	70	23	A
KF2VX	5,500	110	50	13	A

3

Eastern Pennsylvania

K3WNI	19,728	274	72	24	A
K3SWZ	19,272	264	73	24	A
W3KB	10,920	195	56	24	A
W6ORZ	6,930	126	55	15	A
KA3TOV	3,256	88	37	24	A
N3ZKK	143	13	11	4	A
W3WKR	46,092	501	92	15	B

Maryland-DC

N3UN	33,864	408	83	24	A
AF3D	17,024	224	76	24	A
NS3X	2,926	77	38	6	A
K3MM	175,200	1460	120	24	B

Western Pennsylvania

KA3JWJ	28,612	311	92	24	A
K3FH	17,748	261	68	24	A
KC3LV	14,080	220	64	24	A
WA3GPP	12,028	194	62	14	A
KB3AFT	8,316	189	44	8	A
N3UE	6,027	123	49	10	A
N3YEA	4,500	100	45	15	A
KA3FUR	2,046	62	33	9	A
K3UA	444	37	12	2	A
ND8L/3	76,398	714	107	24	B
WW3S	26,124	311	84	24	B
N3IXR (+WA3SES)	34,602	474	73	24	A

4

Alabama

AG4W	36,860	485	76	22	A
W4DEC	28,644	341	84	22	A
N4WIO	2,952	72	41	18	A

Georgia

W4AQL (W4RU,N2NSZ,KE4IWN,ops)	20,100	300	67	24	B

Kentucky

AA2GS	32,494	422	77	22	A
KN4CG	26,781	339	79	24	A
W4LC	25,500	340	75	24	A
K4WW (+K4AT)	57,950	610	95	24	B

North Carolina

K4ZAM	84,630	806	105	24	A
N2NFG	61,506	603	102	24	A
KB5WIA	3,698	86	43	12	A
W4MR (AA4NC,W4CC,K4MA,ops)	105,561	951	111	24	B

Northern Florida

W4WX	69,700	697	100	24	B

South Carolina

VE7CPN/W4	23,874	346	69	21	A
KS4YX	14,012	226	62	19	A
KI4MI	9,179	137	67	24	A
K4DB	66,624	694	96	16	B
N4IQ	40,035	471	85	21	B

Southern Florida

WT4I	99,200	992	100	24	A
K4PX	12,320	220	56	24	A
W3DHN	4,230	90	47	8	A
N8PR	126,996	1114	114	24	B

Tennessee

W4AUI	12,090	186	65	18	A
W4CZ	58,776	632	93	24	B
K4ZQX	4,095	91	45	8	B
W4CV (+ops)	66,048	688	96	24	B

Virginia

KA4RRU	106,275	975	109	24	A
W4JLS	19,656	252	78	24	A
W6IHG	5,880	120	49	14	A
N3TG	308	22	14	24	A
K4GMH	21,320	328	65	24	B
W0YR/4	11,151	177	63	24	B
WA4QDM	15,170	205	74	18	A

5

Arkansas

KD5ZM	90,524	854	106	24	A
K5XH	47,348	532	89	24	A
AC5DK	14,632	236	62	15	A
WA0TDG	7,904	152	52	24	A
AE5H	23,250	375	62	24	B

Louisiana

AA5AU	130,020	1182	110	24	A

Mississippi

N5QDE	7,812	126	62	24	A
KA5LGP	6,966	129	54	24	A
KK5OQ	95,200	952	100	24	B
W5VZF (+WA4DDE,KB4HB)	41,194	479	86	24	A

New Mexico

WB1GSO/5	24,616	362	68	24	A
K4KIY	12,139	199	61	24	A

North Texas

W5PLN	31,840	398	80	24	A
K5WI	14,592	228	64	18	A
K5YO	6,201	117	53	12	A

Oklahoma

W5WYN	9,699	183	53	14	A
N6EU	29,898	453	66	18	B

South Texas

WW2R	103,929	1029	101	22	A
N5XUS	47,440	593	80	24	A
KZ5E	24,412	359	68	24	A
KK5CA	7,140	140	51	9	A
K5DJ	182,390	1495	122	24	B
WA5IZE	12,322	202	61	24	B

6

East Bay

AC4DR	24,003	381	63	24	A

Los Angeles

KN6DV	88,452	972	91	24	A
KR6E	45,444	541	84	24	A
W3SE	36,404	479	76	24	A
W6LAX	27,324	414	66	18	A
KO6VG	3,219	87	37	12	A
WB6CGZ	480	24	20	6	A
K6HGF	37,118	554	67	24	B

Orange

WA6NOL	7,497	147	51	24	A
WM7D	6,298	134	47	24	A
AB6PA	1,568	56	28	8	A
KC6QLZ	1,376	43	32	5	A
N6HC	75,257	827	91	22	B

Santa Clara Valley

N6NT	70,434	819	86	24	A
N2ALE	50	10	5	24	A
W6ISO	17,612	238	74	24	B
AD6AG	2,178	66	33	16	B
K6XX	2,016	63	32	24	B
KI6CK (+W6JVE)	23,184	336	69	16	B

San Diego

W6CN	13,728	208	66	15	A
KD6VKF	713	31	23	6	A
K6CT	35,346	411	86	19	B

San Francisco

WN6W	26,100	348	75	24	A
W6JOX	25,752	348	74	24	B

San Joaquin Valley

K6MI	13,560	226	60	24	A

Sacramento Valley

KD6MS	13,680	240	57	24	A

7

Arizona

AB7LU	38,352	564	68	24	A
AA6TY	28,490	385	74	23	A
K7ON	10,600	212	50	24	A
W7ZT	7,380	164	45	16	A
KB7SLJ	2,706	66	41	10	A
N7GLE	1,530	51	30	5	A
KC7V	59,585	701	85	14	B
AA7A	53,944	613	88	24	B
N7IZM (+KB7YEB,KC7SAK,KB7YEE)	14,880	248	60	24	A

Eastern Washington

K7GS	17,556	266	66	24	A
K7UK	10,324	178	58	16	A
W7RY (+K7DSR,WS7I)	117,327	1057	111	24	B

Idaho

KJ7TH	48,370	691	70	24	A
W7RH	5,640	120	47	24	A
AA7UN	53,884	709	76	24	B
N7UVH	20,801	341	61	23	B

Montana

K7VK	20,860	298	70	20	A
W7MMQ	128,010	1255	102	24	B
N7MNY	6,292	121	52	24	B

Oregon

WJ7S	28,884	348	83	22	A
AA7CP	15,447	271	57	24	A
W7XN	12,720	212	60	14	A
AA7IH	2,528	79	32	13	A
KG7DK	12,288	192	64	24	B

Utah

KB70KD	5.535	123	45	17	A
KC7HHK	1,891	61	31	9	A
K7UB (+KI7VL,KC7NWX)	9,898	202	49	22	A

Western Washington

W7LD	41,230	589	70	24	A
N7VGO	23,694	359	66	21	A
WA7VNI	19,845	315	63	24	A
KB7N	1,947	59	33	24	A
W7NN	88,976	1072	83	24	B
W7TI	88,412	961	92	24	B

8

Michigan

K8SIA	30,879	423	73	24	A
N8MG	16,821	267	63	24	A
K8VT	14,616	261	56	24	A
W8HCS	12,366	229	54	23	A
W8EB	42,966	462	93	17	B
K8RS	17,175	229	75	24	B
KF8KW	12,152	196	62	24	B
WB8OBR (+WB8GAO)	154	14	11	2	A

Ohio

WB8YJF	61,544	628	98	24	A
KI8L	41,676	453	92	17	A
NI8Z	32,308	394	82	20	A
W8IDM	15,028	221	68	24	A
W8AZA	12,558	182	69	20	A
W8FDV	12,328	184	67	24	A
K8AB	8,910	162	55	24	A
KD8FW	8,778	154	57	23	A
KB8KIK	7,946	137	58	14	A
N8CL	4,746	113	42	24	A
N8WS	4,067	83	49	24	A
W8OS	4,000	100	40	24	A
N8CPA	3,367	91	37	17	A
N8PCE	3,280	82	40	8	A
WD8DOS	2,142	63	34	14	A
AB8K	55,182	541	102	24	B
N8LRG (KB8TCF,KB8TRP, KB8VMO,ops)	44,238	438	101	24	A
N8NR (+N9AG)	104,095	955	109	24	B

West Virginia

KG8WB	24,771	359	69	22	A
W8PT	30,102	346	87	24	B

9

Illinois

WO9S	49,231	541	91	24	A
N9THC	46,354	602	77	24	A
W9ZV	18,105	255	71	24	A
AA9NF	8,624	154	56	8	A
WD9EKA	3,239	79	41	12	A
N9RET	2,100	60	35	24	A
KB9HAY	2,016	63	32	15	A
N9BU	1,760	55	32	16	A
N9NCX	85,280	820	104	24	B
W9IL	53,568	558	96	24	B
K9AA (K9PG,op)	15,048	264	57	24	B
W9AX	4,092	93	44	12	B
W9FE (+KB9IWH)	13,662	198	69	24	B

Indiana

KC9UU	8,208	152	54	24	A
K9FT	1,914	58	33	14	A

Wisconsin

N9CK	63,984	688	93	21	A
AA9RR	35,073	433	81	21	A
W9ISC	11,400	200	57	18	A
KB9Q	3,978	102	39	10	A
K9OSH	3,900	100	39	24	A
KF9AQ	3,520	88	40	7	A
KY9P	2,496	78	32	9	A
K9NX	34,112	416	82	24	B
W9PVD	7,260	165	44	24	B
WD9GWH	3,655	85	43	11	B

0

Colorado

K0FRP	11,600	200	58	24	A
N0RN	7,930	130	61	24	A
N0HCH	5,160	129	40	24	A
N0IBT	4,141	101	41	6	A
W0RA	7,140	170	42	5	B
N0ISE	60,060	660	91	24	B

Iowa

WB9BXY	33,768	469	72	23	A
K0SRL	4,428	108	41	8	A
K0FG	22,275	297	75	24	B

Kansas

K0BJ	8,778	154	57	9	A
N0ZCU	2,442	74	33	11	A
WD0BNC	11,264	176	64	24	B

Minnesota

W2JGR	33,696	468	72	24	A
KG0RK	11,872	212	56	21	A
N0ISL	7,095	129	55	12	A
KE0WW	1,938	57	34	8	A
N0RKS	693	33	21	6	A
K0KO	86,142	879	98	24	B
W0ML	19,008	264	72	24	B
N0AEV	18,618	321	58	24	B
W0HW	15,946	238	67	9	B
K0VPR (+K0CRN)	18,009	261	69	24	B

Missouri

K0BX	60,900	609	100	23	A
AA0GY	14,400	200	72	24	A
KI0HA	6,930	126	55	16	A
N0ZOH	4,860	108	45	9	A
W0TMW	3,861	99	39	24	A
N0EID	3,800	100	38	10	A
K0JPL	442	26	17	24	A
N0IT	50,547	609	83	24	B
WB0BBY	28,200	376	75	20	B
KG0QG (+KI0IV)	51,840	540	96	24	A
W0EEE (KI0MI,KB0VLG,ops)	18,414	341	54	24	A
KO0Z (+NF0Q)	32,984	434	76	24	B

North Dakota

WB0O	64,614	726	89	24	B

South Dakota

W0SD (+N0ABE,WB0YQT,AC0M)	124,232	1172	106	24	B

Canada

Quebec

VE2AXO	17,784	247	72	24	A
VE2BOB	17,390	235	74	24	A
VA2BF	15,872	248	64	24	A
VE2OWL	12,255	215	57	23	A
VE2CNJ	3,944	116	34	11	A

Ontario

VA3MM	91,164	852	107	24	A
VE3IAY	28,730	338	85	24	A
VE3HOL	11,403	181	63	24	A
VE3WZ	7,000	125	56	24	A
VA3SWG	5,192	118	44	8	A
VE3EVV	2,475	75	33	24	A
VA3WTM	20,264	298	68	24	B
VE3AA (+VE3XLG,VE3MVF)	7,000	140	50	18	A
VA3HL (+VA3EZ)	6,916	133	52	14	A
VE3FJB (+VE3NDA,VE3IJM,VE3MKX, VA3CW,VE3VSM,VA3EWC,VA3DAP, VE3ABG)	57,960	630	92	24	B

Manitoba

VE4YU	9,408	168	56	24	A

Saskatchewan

VE5SF	27,456	429	64	24	A
VE5CPU	32,240	496	65	24	B

Alberta

VE6JO	37,133	523	71	24	A
VE6JY	108	18	6	24	B

British Columbia

VE7CFD	32,320	505	64	15	A
VE7TLK	23,220	387	60	24	A
VE7DJX	8,624	176	49	15	B

Northwest Territories

VE8NC	4,455	99	45	24	B

Checklogs

DL1JEN, EA1AAA, IZ4BKI, KE4AEB, L50V, OZ8RO, SP3CUG, SP3JHR, SP3MC, SP3QDU, UY1HY, WA2FVL, YL3FW.

By **Billy Lunt, KR1R**
Contest Manager

September VHF QSO Party Rules

1. Object: To work as many amateur stations in as many different 2° × 1° grid squares as possible using authorized frequencies above 50 MHz.

2. Date and Contest Period: The second full weekend of September. Begins 1800 UTC Saturday, ends 0300 UTC Monday (September 12-14, 1998).

3. Entry Categories:

3.1. Single Operator.

3.2. Single Operator, QRP Portable.

3.3. Rover.

3.4. Multioperator.

3.5. Limited Multioperator.

4. Exchange: Grid-square locator (see April 1994 *QST*, p 86).

4.1. Exchange of signal report is optional.

5. Scoring:

5.1. QSO points:

5.1.1. Count one point for each complete 50 or 144-MHz QSO.

5.1.2. Count two points for each 222 or 432-MHz QSO.

5.1.3. Count three points for each 902 or 1296-MHz QSO.

5.1.4. Count four points for each 2.3 GHz (or higher) QSO.

5.2. Multiplier: The total number of different grid squares worked per band. Each 2° × 1° grid square counts as one multiplier on each band it is worked.

5.3. Final score: Multiply the total number of QSO points from all bands operated by the total number of multipliers for final score.

5.4. Rovers only: The final score consists of the total number of QSO points from all bands times the sum of unique multipliers (grid squares) worked per band (regardless of which grid square they were made in) plus one additional multiplier for every grid square activated (made a contact from).

5.4.1. Rovers are listed in the contest score listings under the division from which the most QSOs were made.

6. Miscellaneous:

6.1. Stations may be worked for credit only once per band from any given grid square, regardless of mode. This does not prohibit working a station from more than one grid square with the same call sign (such as a Rover).

6.2. Only one signal per band (6, 2, 1¼, etc) at any given time is permitted, regardless of mode.

6.3. Multioperator stations may not include QSOs with their own operators except on frequencies higher than 2.3 GHz. Even then, a complete, different station (transmitter, receiver and antenna) must exist for each QSO made under these conditions.

7. Awards:

7.1. Certificates will be awarded in the following categories.

7.1.1. Top single operator in each ARRL/RAC Section.

7.1.2. Top single operator on each band (50, 144, 222, 432, 902, 1296 and 2304-and-up categories) in each ARRL/RAC Section where significant effort or competition is evident. (Note: Since the highest score per band will be the award winner for that band, an entrant may win a certificate with additional single-band endorsements.) For example, if WB0TEM has the highest single-operator all-band score in the Iowa Section and his 50 and 222-MHz scores are higher than any other Iowa single operator's, he will earn a certificate for being the single-operator section leader and endorsements for 50 and 222 MHz.

7.1.3. Top single-operator, QRP portable in each ARRL/RAC Section where significant effort or competition is evident. (Single-operator, QRP portable entries are not eligible for single-band awards.)

7.1.4. Top rover in each ARRL Division and Canada where significant effort or competition is evident. (Rover entries are not eligible for single-band awards.)

7.1.5. Top multioperator score in each ARRL/RAC Section where significant effort or competition is evident. (Multioperator entries are not eligible for single-band awards.)

7.1.6. Top limited multioperator in each ARRL/RAC Section where significant effort or competition is evident. (Limited multioperator entries are not eligible for single-band awards.)

7.2. Participation Pins

7.2.1. Available, while supply lasts, to all who make at least 25 contacts (any combination of bands and modes) during the contest.

7.2.1.1. This includes all operators of qualifying multioperator efforts.

7.2.2. Send order to: ARRL Contest Branch, 225 Main St, Newington, CT 06111.

7.2.2.1. Price is $5 for each pin.

7.2.2.2. Make check or money order payable to the ARRL (no cash please).

7.2.2.3. Include a return mailing label (preferably a self-adhesive type).

8. Other: See "General Rules for All ARRL Contests" and "General Rules for ARRL Contests on Bands above 50 MHz (VHF)" December 1997 *QST*.

VHF Participation Pins

Wouldn't it be nice to know that you've qualified for an award during the contest? Would you like to be sure that you will receive an award when you send your September VHF QSO Party log to HQ? Here's an award you can earn, whether you're a first timer or a weathered veteran of the sport. The ARRL is offering a handsome VHF participation pin to qualified participants in the ARRL September VHF QSO Party.

Anyone who makes at least 25 contacts (any mode, any band or any combination) during the 1998 ARRL September VHF QSO Party will qualify for a VHF participation pin. Also all the individual operators of a multioperator station (that qualify) are eligible for their own pins. The handsome pin is marked with the year, making it a possible collector's item. Wear them proudly in support of the September VHF QSO Party.

To order, include with your log entry: (1) a mailing label (preferably self-adhesive label. (2) A check or money order for $5 for each pin, payable to the ARRL (includes the price of the pin, packaging, padded envelope and postage). Your pin will be shipped after your contacts have been verified and the results printed in *QST.*

Scoring Example

Band (MHz)	*QSOs*	*QSO Points*	*Grid Squares*
50	25 (x1)	25	10
144	40 (x1)	40	20
222	10 (x2)	20	5
432	15 (x2)	30	10
1296	6 (x3)	18	3
Totals	96	133	48

Final score = (QSO points) x (total no. grid squares): (6384 = 133 x 48).

How to Get Entry Forms

Official entry forms for the 1998 September VHF QSO Party are available electronically from several sources:

• From the ARRL Internet Infoserver. Send e-mail message to **info@arrl.org**. The subject line is ignored. Enter the following text in the body of your message:

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HELP
SEND VHFQSO.FRM
SEND SEPVHF.RLS
QUIT
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• From the ARRL BBS (860-594-0306), in File Area 2 (contests).

• From the ARRL's Web page, at **http://www.arrl.org/contests/forms**.

Complete rules and entry forms for all the ARRL-sponsored contests are included in the *ARRL Contest Yearbook*, which is available for $5 plus shipping from Publication Sales at ARRL HQ.

Strays

I would like to get in touch with ...

◊ any hams who are graduates or students of the School of the Ozarks. Being a grad from the '60s, I would like e-mail or postal mail from former students. Pat Wilson, K4OW, HS 62, JC 65, 4416 New Kent Highway, Quinton, VA 23141; e-mail **pw@i2020.net**.

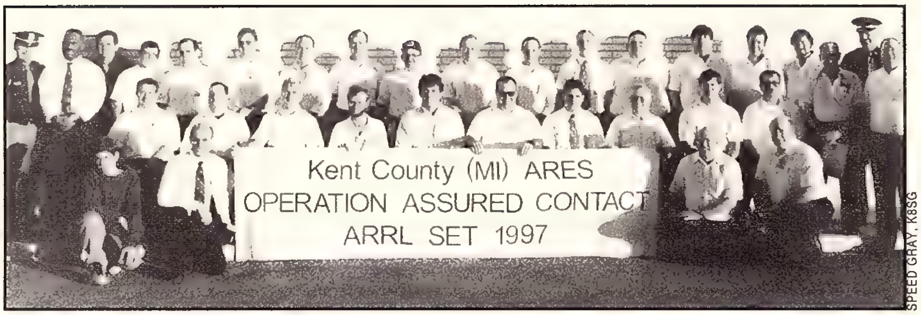
◊ anyone who was on Ice Station Alpha near the North Pole in August 1958 when the *USS Skate* (SSN 578) surfaced there. William R. Gardner, WA0VCU, Rt 2, Windsor, MO 65360.

By Steve Ewald, WV1X

Get Ready, Get SET, Go!

The 1998 Simulated Emergency Test is October 3–4.

Are you ready for the 1998 ARRL Simulated Emergency Test? It's just around the corner, October 3-4, 1998. ARRL Field Organization leaders are planning an event that will actively involve members of the Amateur Radio Emergency Service (ARES), the Radio Amateur Civil Emergency Service (RACES) and the ARRL National Traffic System (NTS). Public service agencies in your community will also be invited to participate. You, too, can be a part of this training exercise!



SPEED GRAY, K8SG

After their successful simulated emergency test last year, the Kent County (Michigan) ARES evaluated their performance. The Kent County ARES serves the Grand Rapids community.

How to Join the SET

To participate in this year's emergency test, contact your local ARRL emergency coordinator or net manager to find out what's going on. If you don't know who to call, get in touch with your ARRL section manager for assistance. See page 12 of *QST* for contact information or check the ARRL Web page. The URL to start with is **http://www.arrl.org/field/org/smlist.html**. From there, you'll find links to several individual section home pages. Whether you're a new licensee or an experienced radio amateur, the SET is a great opportunity to learn or practice useful skills in traffic handling, net operation and emergency communications management.

Operation "Assured Contact"

Thanks to Speed Gray, K8SG, the Kent County (Michigan) Emergency Coordinator, for sending Headquarters a copy of the 1997 Kent County ARES Simulated Emergency Test information package. Here are some excerpts that highlight the purpose, objectives and expectations of their test. This example should help you generate some ideas for your own SET this year.

"Each fall the ARRL encourages local emergency communications groups to participate in an organized field effort to test and evaluate their volunteer resources in emergency communications and message handling capability. This year, the Kent County ARES group will be mobilizing what we hope to be a massive display of Amateur Radio based communications capability to served agencies.

Exercise Design: What's the SET all about?

- Involve as many ARES operators as possible.
- Activate as many fire station facilities in the county as possible
- Each participant will receive a specific location assignment
- Pass traffic to net control and between served agency locations.
- Improve the skill level of participants in working with served agencies in handling formal traffic, and increase the experience of volunteers working in a directed net environment.

Exercise Objectives: What are the Expectations?

- Test our ability to field a large task force of communicators in a short period of time.
- Test our ability to direct a large net operation.
- Test our ability to contact and professionally pass traffic from the assigned served agency.

What's Required of Me as a Participant?

- Be familiar with Kent County ARES procedures for directed net operations.
- Know operating protocols as outlined in the emergency communications plan.
- Have 2-meter capability
- Complete a written exercise evaluation form at the end of the exercise."

SET to Go!

Additional background on this national drill is presented in the article, *1997 Simulated Emergency Test Results*. See the July 1998 *QST*, page 51. Also, guidelines for the SET will be published in this summer's edition of the *ARRL Field Forum* newsletter. Reporting forms will be mailed separately to the Field Organization leadership officials in charge of SET activities.

Although October 3-4 is the main weekend for SET, ARES teams or nets may conduct their exercises anytime between September 1 and November 30. Check with your local ARRL Field Organization leadership for the exact date in your area.

There is a heightened awareness of the need for emergency communications caused by the many recent weather-related disasters. Your help is needed, and the ARRL SET '98 is a great way to get involved in public service communications.

Contest Corral

Edited by **George Fremin III, K5TR***

Feedback

In the **1997 ARRL International EME Contest** results, **VE1ALQ** was omitted with a score of 187,000, 55 QSOs, and 34 multipliers in the single operator, single band, 1296 MHz category.

In the **1997 ARRL 160 Meter Contest** results, **NE8I** was omitted, with a score of 2,700, 54 QSOs, 25 multipliers in MI.

In the **1998 January VHF Sweepstakes**, **W5UWB** was omitted with a score of 66,744, 374 QSOs, 162 multipliers in TX; **K0RZ** was omitted with a score of 948, 18 QSOs, 12 multipliers in CO. **KF4KSN** was listed as KF4KSW.

In the **1997 November Phone Sweepstakes**, **N1AU** was omitted with a score of 18,206, 457 QSOs, 79 multipliers in EMA; **K3DI** was omitted with a score of 103,490, 655 QSOs, 79 multipliers in MDC. **K0FJ** was listed as low power. He was high power.

W1AW Qualifying Runs are 10 PM EDST Thursday, August 6, and 4 PM EDST Friday, August 21. The **West Coast Qualifying Run** will be at 9 PM PDST on Wednesday, August 5. Check the W1AW schedule for details.

August

1

ARRL UHF Contest, see July *QST*, page 105.

North American QSO Party, CW sponsored by the *National Contest Journal*, 1800Z Aug 1 to 0600Z Aug 2, (phone is Aug 15-16). Single op (single op must take 2 hours off time in 30 min or more periods) and multi-two (10 min rule). Single ops may not use spotting nets or PacketCluster, and may have only one transmitter signal at a time. All entrants must use 150 W or less. Work stations once per band. Exchange name and state/province/DXCC country. North American stations (and KH6) work everyone; others work North American stations only. CW—1.815 3.535 7.035 14.035 21.035 28.035 (35 kHz Novice/Tech); phone—1.865 3.850 7.225 14.250 21.300 28.450. Try 10 meters at 1900Z and 2000Z; 15 meters at 1930Z and 2030Z; and 160 meters at 0430Z and 0530Z. Final score is QSOs × states (incl. KH6), provinces and North American countries per band. Team Competition. Awards. Send logs 30 days after contest date to: (CW) Bob Selbrede, K6ZZ, 6200 Natoma Ave, Mojave, CA 93501; e-mail **K6ZZ@ccis.com**—(phone) Bruce Horn, WA7BNM, 4225 Farmdale Ave, Studio City, CA 91604, e-mail **bhorn@hornucopia.com**.

Ten-Ten International Net Summer Phone Contest sponsored by Ten-Ten International, 0000Z Aug 1 to 2400Z Aug 2. Single op, phone only, 10 meters only. Exchange call sign, name, state/country and ten-ten number (if member). Score 1 pt./QSO w/nonmember, 2 pts/QSO w/member in contiguous US, 3 pts/QSO w/DX. Final score is QSO points. Send logs by Aug 17 to: Brooklyn Bridge Chapter, PO Box 080500, Staten Island, NY 10308.

QRP ARCI Summer Daze SSB Sprint sponsored by QRP ARCI, 1900Z to 2100Z Aug 2 high bands. 7 PM to 9 PM local time for low bands. 40 meters uses both time periods. CW only. Entries may be All Band, High Band (40, 20, 15, 10, 6) or Low Band (160, 80, 40). Work stations once per band. Exchange signal report, state/province/country and name. 1.860 3.865 7.285 14.285 21.385 28.385 50.128. One point per QSO. Bonus points, per band, for using homebrew (equipment you built) gear: 500 points for transmitter, 500 points for receiver, 1000 points for transceiver. Final score is total QSO points (all bands) multiplied by total of states/provinces/countries (all bands) times power multiplier (> 5 W out × 1, < 5 W out × 7, < 1 W out × 10, < 250 mW out × 15. SSB power is considered to be twice the dc output power), plus bonus points. Include a description of equipment and antennas used. Mail entry by Sept. 2 to: QRP ARCI, Cam Hartford, N6GA, 1959 Bridgeport Ave, Claremont, CA 91711; or e-mail to **CamQRP@cyberg8t.com**

YO-DX Contest sponsored by the Romanian Amateur Radio Federation (RARF). 0001Z to 2000Z Aug 2, 80 to 10 meters, phone and CW. No crossmode QSOs. Classes: single op, single band; single op, multiband; multiop, multiband. Exchange RST and ITU zone. YO stations will send two letters indicating their county. Count 0 pts/QSO with own country, 2 pts/QSO with own continent, 4 pts/QSO with different continents and 8 pts/QSO for YO stations. Multiply by sum of YO counties and ITU zones worked per band. Mail entries by Sept 3 to Romanian Amateur Radio Federation, PO Box 22-50; R-71100 Bucuresti Romania. You'll find more information on the Web at **http://www.qsl.net/yo3kaa/.**

8-9

Maryland-DC QSO Party, sponsored by Antietam Radio Association, 1600Z Aug 8 to 0400Z Aug 9 and 1600Z Aug 9 to 2359Z Aug 9, phone and CW (CW in subbands/no crossmode QSOs). Work stations once per band/mode, portable/mobiles can be worked again in each county. No packet, repeater or net QSOs, MD-DC stations work everyone, others work only MD-DC. Exchange QTH and category (Club, QRP, Mobile, Novice/Tech and Standard). CW—3.643 3.701 7.035 7.126 14.040 21.115 28.040, phone—3.920 7.230 14.268 21.370 28.380 50.150 (VHF/UHF on CW/phone also). Count 5 pts/mobile QSO, 4 pts/QRP QSO, 3 pts/CW, RTTY or ATV QSO, 1 pt for all others. Highest single point applies. Final score is total QSO points × multipliers (MD counties, Baltimore and DC). MD-DC stations include states/provinces/DXCC countries. Awards. Club competition. Send logs by Sept 1 to: Antietam Radio Association, PO Box 52, Hagerstown, MD 21741-0052.

Worked All Europe DX Contest, CW, sponsored by the Deutscher ARC, 0000Z Aug 8 to 2400Z Aug 9, (phone is Sep 12-13; RTTY is Nov 14-15). 80-10 only. Single op (PacketCluster or spotting nets allowed; 36 hours max, up to three off periods 1 hour min) and multi-single (only one signal/band). Send RS(T) and serial number. Score 1 pt/QSO and 1 pt/QTC. Non-European stations must work Europe only (except on RTTY, where everyone works everyone, but QSOs are not allowed within your own country). Final score is QSOs + QTCs × EU countries/band, (except on RTTY: WAE countries + DXCC countries). 3.5 MHz QSOs, × 4; 7 MHz, × 3; 14-28 MHz, × 2. A QTC is a report of confirmed QSOs that took place earlier in the contest that is sent back to a European station. QTCs may be sent only by non-European stations to European stations. A QTC contains the time, call sign and QSO number of the station being reported (eg 1307/dl1aa/346). A QSO may only be reported once, and not back to the originating station. A maximum of 10 QTCs can be sent to the same station, the same station can be worked several times to complete this quota. Only the original QSO has QSO point value. Keep a list of QTCs sent. For example, QTH 3/7 would indicate that this is the third series of QTCs sent, and seven QSOs are reported. Awards. Club competition. E-mail entries to **100712.2226@compuserve.com** Deadlines: CW—Sep 15; phone Oct 15; RTTY, Dec 15. Send logs to WAEDC Contest Committee, PO Box 1126, 74370 Sersheim, FR Germany.

15-16

ARRL 10 GHz and up Cumulative Contest, see June *QST* page 87.

New Jersey QSO Party, sponsored by Englewood ARA, 2000Z Aug 15 to 0700Z Aug 16, 1300Z Aug 16 to 0200Z Aug 17. Phone and CW. CW contacts may not be made in phone band segments. 3 pts/QSO. Out-of-state stations, QSO pts × NJ counties worked. NJ stations, QSO pts × states (but not NJ)/provinces/NJ counties. Logs must show UTC date and time, call sign, exchange, band and claimed multiplier. Awards. Logs and comments (incl. SASE for results) no later than Sep 12 to: Englewood ARA, PO Box 528, Englewood, NJ 07631-0528.

North American QSO Party, Phone, see Aug 1-2 listing.

SARTG RTTY Contest, sponsored by the Scandinavian ARTG, 0000-0800Z Aug 15 and 1600Z-2400Z Aug 16. Work stations once/band. Single op, all and/or single band, multi-single and SWL. PacketClusters and DX spotting-net assistance permitted in all classes. Send RST and serial number. Score 5 pts/QSO w/own country; 10 pts/QSO w/other countries in the same continent; and 15 pts/QSO w/other continents. In JA/VE/VK/W each call area counts as a separate country. Use separate log sheets for each band. Awards. Club competition. Send logs by Oct 10 to: SARTG Contest Manager, Ewe Hakansson, SM7BHM, Box 9019, SE-291 09 Kristianstad, Sweden; e-mail **sm7bhm@kristianstad.mail.telia.com.**

W/VE Islands Contest, sponsored by US Islands Awards Program, 1700Z Aug 15 to 2300 Aug 16. Work as many American or Canadian islands on HF (any mode) as possible. Categories: "A" Island stations, "B" Non-island stations and "C" Island rovers. "A" stations work as many W/VE islands and non-islands as possible. "B" stations work W/VE islands only. "C" stations same as "A" but include separate logs for each island operated from. Exchange: "A" and "C" send RST, W/VE island number and island name. "B" send RST state/province or country. 1 pt/QSO for each non-island station worked, 5 pts/QSO for each island station worked. Awards. Send logs to: John Reisenauer, Jr, KL7JR, 23406 East Kennedy Rd, Benton City, WA 99320; **http://www.eng.mu.edu/~usi**.

SEANET Contest, Phone, see July *QST* page 98.

22-23

TOEC WW Grid Contest, CW, see June *QST* page 87.

29-30

SCC RTTY Championship, sponsored by the Slovenia Contest Club and *Svet Elektronike Journal*, 1200Z Aug 29 to 1200Z Aug 30, 80-10 meters, Single op, all band and single band. Multi-single. High and low power (200 W or less) categories. Exchange RST and 4 digit number for first year of amateur license issue. Scoring: 1 pt/QSO w/your country, 2 pts/QSO w/your continent, 2 pts/QSO for contacts between different W, VE, VK, ZL, ZS, JA and PY call areas, LU provinces and Asiatic Russian oblasts UA9/UA0. 3 pts/QSO outside your continent. Multipliers are different license years worked on each band. Total QSO points × total multiplier equal total score. Awards. Send logs to: Slovenia Contest Club, Saveljska 50, 1113 Ljubljana, Slovenia, Europe; e-mail **scc@hamradio.si**.

Hawaii QSO Party, sponsored by the Hawaii DX Society KH7XX, 1600Z Aug 29 to 2200Z Aug 30, Single op, multi-single (CW, phone or mixed mode) and multi-multi (mixed mode only). Spotting nets and DX PacketClusters allowed in all classes. Work stations once per band and mode. CW 30 kHz up from band edge, phone 25 kHz up from General band edge. Exchange RS(T) and state/province/country or maritime region, Hawaii station use RS(T) and county. 1 pt/phone QSO, 2 pts/CW QSO. Multipliers: non-Hawaii stations – number of Hawaii counties (5); Hawaii stations – number of states (49) + Canadian provinces (13) + DXCC countries (excluding W/VE, KH6 and KL7). Add 150 pts to your total score if you work KH7XX. Total score is total QSO pts × total multipliers. Send logs to:

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*913 Ramona Street
Austin, TX 78704
e-mail **k5tr@arrl.org**

HDXS—KH7XX, 1056 Kupau St., Kailua, HI 96734; e-mail **starcommradio@juno.com**

BUBBA Summer QRP Sprint, sponsored by the AZ ScQRPions, 1800Z-2200Z Aug 30. HF bands, standard QRP calling frequencies (including 30/17/12 meters), CW only, 5 W or less only. Single op or multiop, indoor or outdoor. Exchange RST, state/province/country and temperature (F) at the operating position. Indoor ops use highest operating temperature, outdoor ops use NWS heat index (**http://www.nws.noaa.gov/er/cae/heat.htm**). Score 1 pt per QSO, Each state/province/country counts once per band. Power multiplier: 1-5 W × 1, less that 1 W × 2. Category multiplier: Indoor × 1, Outdoor × 2. Send logs by Sept 30 to: Joe Gervais, PO Box 1822, Goodyear, AZ 85338; e-mail **vole@primenet.com**.

South Dakota QSO Party, sponsored by the Prairie Dog ARC, 1600Z Aug 29 to 2200Z Aug 30. Phone and CW. Categories: Single Op QRP (<10 W), Low (10-100 W), Medium (100-150 W), High (>150 W); Single Op Portable; Multi-Single; Multi-Single Portable; Multi-Multi; Novice/Tech; Mobile; Rover (South Dakota stations only). 160-10 meters (excluding 30, 17, and 12 meters) and VHF. South Dakota stations send serial number and county. Others send serial number and ARRL/RAC section or DXCC country. Work stations once per band and mode. Work mobiles as they change counties. South Dakota stations work everyone; others work South Dakota only. Scoring: 4 pts/QSO on phone on 160, 80 or VHF; 2 pts/QSO on phone on other bands; 8 pts/QSO on CW on 160, 80 or VHF; 4 pts/QSO on CW on other bands; 25 pts/QSO for CW contact with club station W0OJY, designated club member stations and other South Dakota club stations. Multipliers: South Dakota counties (South Dakota stations add ARRL/RAC sections and DX). Score = QSO pts × multipliers. Logs must show UTC date and time, call sign, exchange, band and claimed multiplier. Awards. Logs and comments (incl. SASE for results) by September 30 to: Terry Gorham, N0IGP, 1204 Whiting St, Yankton, SD 57078.

Special Events

Edited by ***George Fremin III, K5TR****

Lebec, CA: Kern County-Central Valley ARC, Inc, W6LIE, 1500Z **Aug 1** to 0200Z **Aug 17**, Commemorating the US A-Company 1st Dragoons at Ft Tejon State Historic Park, 14.180 21.380 145.150 145.790. QSL. Kern County-Central Valley ARC, PO Box 743, Bakersfield, CA 93302.

Bartlett, TN: Delta Amateur Radio Club, W4BS, 1300Z **Aug 1** to 2200Z **Aug 2**, 10th Anniversary of the FedEx/St. Jude Golf Classic, 7.235 14.235 21.335 28.435. Certificate. Delta Amateur Radio Club, PO Box 750482, Memphis, TN 38175-0482.

High Point, NC: High Point Amateur Radio Club, W4UA, 1600Z-2100Z **Aug 2**, First Annual Home Furnishing's Festival, 14.250 21.350 147.165. Certificate. High Point Amateur Radio Club, PO Box 4941, High Point, NC 27203.

Elgin, IL: The Antique Radio Club of Illinois, N9CQX, **Aug 5** to **Aug 8,** Operating from Radiofest XVII. Certificate. ARCI, PO Box 1139, LaGrange, IL 60526.

Camp Marcella, NJ: Piscataway Amateur Radio Club, K2VOA, **Aug 8**, operating from Camp Marcella for Blind and Visually Impaired Children. 7.250 14.245. QSL. Piscataway Amateur Radio Club, PO Box 1233, Piscataway, NJ 08854.

Oscoda, MI: Iosco County Amateur Radio Enthusiasts, K8Y, 1300Z **Aug 8** to **Aug 9** 2100Z, Yankee Air Force Museum In Conjunction with I.C.A.R.E. Hamfest, 3.700 3.885 7.125 14.270. Certificate. Ray Knuth, KB8ZYY, PO Box 271, Oscoda, MI 48750.

Long Beach Island, NJ: The Old Barney Amateur Radio Club, N2OB, 1300Z **Aug 8** to 2200Z **Aug 9,** National Light House Week, 7.240 14.260 146.52 146.835. Certificate. N2OB, PO Box 345, Tucherton, NJ 08087.

Hawley, PA: Camp Watonka Amateur Radio Club, KB3BUM, 1300Z **Aug 8** to 2200Z **Aug 9,** 35th Anniversary of Camp Watonka Boys Science Camp, 7.280 14.280 21.280 28.380. QSL. Camp Watonka ARC, PO Box 127, Hawley, PA 18428.

Cresco, IA: Tri State ARC, WA0AUU, 1230 UTC **Aug 8** to 0030 UTC, **Aug 16**, Worlds first airline stewardess-on the air from her home town. 3.855 7.280 14.300 14.250. Certificate. Ernie Martin, 403 W 2nd St, Cresco, IA 52136.

Waco, TX: Central Texas HF Society, W5R, 1500Z **Aug 8** to 2400Z **Aug 30,** 175th Anniversary of the Texas Rangers Law Enforcement Agency. Certificate. Larry Merritt, KB5BFM, PO Box 3501, Waco, TX 76707-0501.

Sycamore, IL: Kishwaukee Amateur Radio Club, W9S, 1300Z **Aug 13** to 1900Z **Aug 16**, 42nd Anniversary of Northern Illinois Steam Power Show, 7.235 14.030 14.250 28.350. Certificate. Bob Yurs, W9ICU, PO Box 341, Sycamore, IL 60178.

Hamburg, NY: Southtowns ARS, WB2ELW, 1400Z **Aug 13** to 1200Z **Aug 24**, 105th Annual Erie County New York Fair, 7.225 14.15 21.2 28.4. Certificate. STARS, WB2ELW, 6120 McKinley Pkwy, Hamburg, NY 14075.

South Bend, IN: Michiana ARC, K9F, 1400Z-2200Z **Aug 15**, Annual College Football Hall of Fame Enshrinement Festival, 7.250 14.250 21.330 28.440. QSL. Bud Stroop, KB9KFZ, 1520 Oakdale Dr, South Bend, IN 46614.

Wilmington, NC: Azalea Coast ARC, AC4RC, **Aug 15**. Operating from the original radio room of the battleship *USS North Carolina* (BB 55), 7.250 14.250 21.35 28.400. QSL. AC4RC, Box 4044, Wilmington, NC 28406.

Mount Vernon, OH: Mount Vernon ARC, **Aug 15**. Honoring the birthplace of Dan Emmett, who wrote the song "Dixie." 7.260. Certificate. MVARC, PO Box 372, Mount Vernon, OH 43050.

Manitowoc, WI: Mancorad RC, W9DK, 1400Z-2000Z **Aug 15**, 54th Anniversary of the WWII *USS Cobia* first war patrol in the Pacific, 7.250 14.250. Certificate. Fred Neuenfeldt, W6BSF, 4932 S 10th St, Manitowoc, WI 54220-9121.

Waseca, MN: Viking ARS, WA0CJU/9ALD, 0800Z-2100Z **Aug 15** and **Aug 16**, honoring E F Johnson, 3.885 7.290 14.250 28.400. QSL.

Cambridge, OH: Cambridge Amateur Radio Association, W8VP, 1200Z **Aug 21** to 1900Z **Aug 23**, Guernsey County Ohio Bicentennial and Civil War Reenactment, 3.915 7.235 14.250 21.325. Certificate. W8VP, PO Box 1804, Cambridge, OH 43725.

Howell, MI: Livingston County ARC, N8M, 1200Z **Aug 21** to 2200Z **Aug 23**, 39th Annual Howell Melon Festival, 7.230 14.230 28.400. Certificate. Jim Besancon, K8SIA, 5353 Highlawn Way, Brighton, MI 48114.

Oxnard, CA: Ventura County ARC, K6MEP, 0000Z-2400Z **Aug 22**, 60th Anniversary of ARRL Affiliation, 7.100 28.340 21.400. Certificate. K6MEP, Box 2103, Oxnard, CA 93034.

Cornville, ME: Pine State Amateur Radio Club, W1ME, 1400Z-2200Z **Aug 22**, Cornville Bicentennial, 3.675 3.890 7.265 14.265. QSL. Charles C. Kadyk N1QJX, RFD. #1, Box 1945, Cornville, ME 04976.

St. Charles, MO: St. Charles Amateur Radio Club, WB0HSI, 1400Z-1800Z **Aug 22**, The Festival of The Little Hills, 7.240 14.240 21.240 28.350. Certificate. SCARC –WB0HSI, PO Box 658, St. Charles, MO 63302-0658.

Northport, Long Island, NY: American Red Cross Emergency Communications Service Queens, NY, K2ARC, 1200Z-2300Z **Aug 22**, 200th Anniversary of the Eaton's Neck Lighthouse, 7.280 14.280 21.380 28.380. QSL. CABNY-ARCECS DX Association, PO Box 1479, Huntington, NY 11743.

Vinton, IA: Benton County ARC/Benton County ARES, K0KBX, 1500Z **Aug 22** to 2100Z **Aug 23**, Civil War Encampment at Vintons BCR&N depot/museum, 3.977 7.275 14.290 18.130. Certificate. Robert Spangler, Box 188, Vinton, IA 52349.

Camden, NJ: South Jersey Radio Association, K2AA/LV79, 0000Z **Aug 22** to 2359Z **Aug 23**, Operating from the Barnegat Lightship. QSL. K2AA/LV79, 15 Pelham Road, Marlton, NJ 08053.

Highlands, NJ: Garden State Amateur Radio Association, W2GSA, 1800Z **Aug 22** to 2000Z **Aug 23**, Lighthouse Activity Weekend, 3.785 7.240 14.245. QSL. GSARA, PO Box 34, Fair Haven, NJ 07704.

Fire National Seashore, NY: Great South Bay ARC and Islip ARES Group, W2GSB, 1400Z **Aug 22** to 2200Z **Aug 23**, Fire Island Lighthouse, 7.260 14.260. Certificate. Rich Tygar AC2P, 5 Chelmsford Dr, Wheatley Heights, NY 11798.

Chesapeake Bay, VA: Chesapeake Bay Nautical Net, K2JXW/MM, 1200Z **Aug 22** to 2200Z **Aug 23,** National Light House Week, 3.968 7.268 14.268 21.368. QSL. Jim Weidner, PO Box 2178, Riverton, NJ 08077.

Aurora, CO: Sand Creek Raiders, KG0ER, 1300-2200Z **Aug 27-30** General class of 75 40 20 15. Certificate. Romie Miller, 26900 E Colfax, Box 335, Aurora, CO 80018.

Syracuse, NY: Liverpool ARC, W2CM, 1300-0100Z, **Aug 27-Sept 7**, NY State Fair 80-10 SSB, all CW. Certificate. Dick Page, AC1M, 2939 Lafayette Rd, Lafayette, NY 13084.

Long Beach, CA: Xerox Amateur Radio Club, WD6CZH, 1600Z-2400Z **Aug 29**, A special event station about "nothing". Certificate. XAR c/o Doug Tice, 6940 Bacarro St, Long Beach, CA 90815.

Richmond, CA: East Bay Amateur Radio Club, W6CUS, 2000Z **Aug 29** to 0800 **Aug 30**, Celebrating 50 years of service to the East Bay Community. 7.237 14.237 21.377. Certificate. John Wood, 5948 Fern Street, El Cerrito, CA 94530.

Pikes Peak, CO: Colorado VHF Group, K0YB, 1500Z-1800Z **Aug 30**, Colorado 14er Event, operating from the summits of Colorado mountains, 446.0 223.5 146.55. QSL. Bob Witte, 21060 Capella Dr, Monument, CO 80132.

Certificates and QSL cards: To obtain a certificate from any of the special-event stations offering them, send your QSO information along with a 9×12 inch self-addressed, stamped envelope to address listed in the announcement. To receive a special event QSL card (when offered), be sure to include a self-addressed, stamped business envelope along with your QSL card and QSO information.

Special Events Announcements: For items to be listed in this column, you must be an Amateur Radio club, and use the ARRL Special Events Listing Form. Copies of this form are available via Internet (**info@arrl.org**), the ARRL BBS (860-594-0306), or for a SASE (send to Special Requests, ARRL, 225 Main St, Newington, CT 06111, and write "Special Requests Form" in the lower left-hand corner. Submissions must be received by ARRL HQ no later than the 1st of the second month preceding the publication date; ie, a special event listing for **Nov** *QST* would have to be received by **Sep 1**. Submissions may be sent on an MS-DOS floppy disk in ASCII format, via fax at 860-594-0259, via modem (860-594-0306), via the Internet (to **special@ arrl.org**), or in letter form.

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*913 Ramona Street
Austin, TX 78704
e-mail **k5tr@arrl.org**

Section News

Edited by **Steve Ewald, WV1X** • *Assistant Field Services Manager*

The ARRL Field Organization Forum

Field Organization Abbreviations

ACC	Affiliated Club Coordinator
ARES	Amateur Radio Emergency Service
ASM	Assistant Section Manager
BM	Bulletin Manager
BPL	Brass Pounders League
DEC	District Emergency Coordinator
DXFR	DX Field Representative
EC	Emergency Coordinator
LGL	Local Government Liaison
NCS	Net Control Station
NM	Net Manager
NTS	National Traffic System
OBS	Official Bulletin Station
OES	Official Emergency Station
ORS	Official Relay Station
OO	Official Observer
OOC	Official Observer Coordinator
PBBS	Packet Bulletin Board Station
PIC	Public Information Coordinator
PIO	Public Information Officer
PSHR	Public Service Honor Roll
SGL	State Government Liaison
SEC	Section Emergency Coordinator
SM	Section Manager
STM	Section Traffic Manager
TCC	Transcontinental Corps
TA	Technical Advisor
TC	Technical Coordinator
TS	Technical Specialist
VC	Volunteer Counsel
VCE	Volunteer Consulting Engineer
VE	Volunteer Examiner

ATLANTIC DIVISION

DELAWARE: SM, Randall K. Carlson, WB0JJX—Congratulations to the Delmarva Hamfest Association Scholarship winner Jeffery Morris, N3WEL, from Hockessin, DE. Jeffery is a recent graduate from St Marks High School and will be attending Rensseleur Polytechnic in the Fall. We wish him well in his future studies. Now to do a bit of housekeeping. In my June column, I inadvertently listed a couple of call signs incorrectly. I want to take a minute to correct them. Larry Rolls, OBS, should have been listed as K3LT. Under the OO list, Jerry Palmer should have been listed as N3KRX. If you are looking for something new to explore in the area of Amateur Radio, you might consider the use of Amateur Radio for radio control of models such as airplanes, helicopters, etc. By using special control transmitters and receivers that operate in the area of the 6 meter band, amateurs can control the motion of a variety of models. If this is an area that might interest you, there are several hams in Delaware wno are active and have knowledge in this area. There are RC clubs as well that can help you with the modeling as well. If interested, drop me a note, and we will refer you to someone that can help get you started. 73, Randall.

EASTERN PENNSYLVANIA: SM, Allen Breiner, W3TI—SEC: WB3FPL. STM: W3KOD. OOC: W3DZI. SGL: KI6NJ. TC: N3HTZ. ASMs: WY3K, K3TX, N3KYZ, WB3FQY. Congratulations are in order for Thomas C. Freedom, W3HVE, who is the recipient of the 50-year membership plaque from the League. Members of Del-Lehi ARC N3IYX, KA3MOU, N3ULW, N3XRL, KA3MOB and W3PYF participated in an Amateur Radio demonstration at the Lower Nazareth Elementary School Safety and Health fair. Have you changed your call lately? N3IGA is now WX3TAZ. The Montgomery County March of Dimes walk was provided radio communications by the following RACES members; WA3AKK, WD0ESL, N3FKR, NE3I, and N3OMA. Did you ever hear of a "Milliwatter"? N3IUT using transmitter running less than one watt has Worked All States and now working on his DXCC with only 35 more countries to go. If you are interested in QRP, N3AT has organized a group and will be glad to give a demonstration and presentation at your club meeting. KA3WGF, KB3ABY, K3NYX, KB3CFV and W3TI assisted the Tuscarora Radio Controlled Flying club as their transmitter impound for the Annual Air Show. Congrats to the following upgrades: KB3CFU to General and N3VPC to Advanced. At the time of this writing the EPA FEEDLINE Section bulletin was mailed to every Field Service appointee and affiliated club in the section. It contained detailed information for the Affiliated Club Coordinator program. To simplify the operation of that ACC appointment, the section has been divided into five districts, which will be more applicable for the new Affiliated Club Coordinators program. The next item required to make the system work is volunteers. A post card, letter or radiogram will bring further details and an application for appointment consideration. SEC Eric Olena, WB3FPL, has restructured the 11 Emergency Coordinator districts in order that they will coincide with the 5 Affiliated Club Coordinator districts. Hence, the boundaries for the new DEC and ACC district county map will be the same. The new districts consist of the following county borders: District 1: Bucks, Chester, Delaware, Montgomery, and Philadelphia. District 2: Berks, Carbon, Lehigh, Northampton, and Schuylkill. District 3: Lackawanna, Luzern, Monroe, Pike, Wayne, Susquehanna, and Wyoming. District 4: Bradford, Columbia, Lycoming, Montour, Northumberland, Snyder, Sullivan, Tioga and Union. District 5: Adams, Cumberland, Dauphin, Juniata, Lancaster, Lebanon, and Perry. At the time of this entry (June 1), there are areas in our section that are still mopping up after the chaos and destruction caused by tornadoes. And now we are about to enter the hurricane season. Also with the heat of summer comes the thunder storms accompanied by lightning, which means it's time to check out the shack grounding system. Lest we forget, safety first always comes last. The following counties have vacancies for an Emergency Coordinator appointment; Adams, Bradford, Bucks, Cumberland, Delaware, Juniata, Lackawanna, Perry, and Tioga. Anyone active in Emergency Communications and interested in the Emergency Coordinator appointment in those counties are urged to drop a line to Eric Olena, WB3FPL, RR 5, Box 5687, Mohnton, PA. 19540. Our newly appointed State Government Liaison, Max, KI6NJ, is working on a program to get each club and its membership in the section involved with a Local Government Liaison appointment. Tfc for May: W3KOD 712, N3DRM 524, W3IVS 436, W3HK 218, N3EFW 178, W3IPX 103, N3AT 46, N3NNH 41, WA3EHD 35, AD3X 32, N3HR 25, N3YSI 23, K3TX 20, W3JKX 17, WY3K 14, W3NNL, KA3FTG 11, KA3LVP 10, K3ARR 9, N3DCG 8, W3TI 8, KA3KMH 7, N3KYZ 6, W3TWV 6, WA3CKA 5, W3DP 4, WB3GCK 1.

MARYLAND/DC: SM, Bill Howard, WB3V (wb3v@erols .com)—ACC: Tony Young, WA3YLO, 301-262-1917. ASM: Jerry Gavin, NU3D, 410-761-1423 (k2ilq@aol.com.) ASM/RACES Coord: Al Nollmeyer, W3YVQ (alyvq@juno.com). BM: Al Brown, KZ3AB, 301 490-3188 (Al_Brown@ix.netcom .com). SEC: Mike Carr, WA1QAA (bamcc@erols .com) 410-799-0403. STM: Bruce Fleming 301-863-6582 (MEGASWOOP@aol.com). TC: Bob Bruninga WB4APR 410-553-6021 brunga@greatlakes.nadn.navy.mil) MDC Section Web homepage www.erols.com/wb3v/mdc/. Please visit the MDC home page for all the latest links, information and more nets! CARR EC N3JIA reports 14 members, 6 net sessions on 145.41 with liaison to MEPN, MDD, MSN, BTN, WVPN, and DTN. OES reports received from KE3FL N3JIA N3TOT N3SOK WX3F, N3JIA and N3TOT AEC reports received from N3HYJ and KG6TU. The CARET net has been using the ARES Field Resources Manual for training. Weekly several pages of the manual have been discussed and where applicable, information has been provided to fill in the manuals with Carroll County ARES specific information. ANAR EC N3QXW reports 49 members, 3 nets on 147.805 with liaison to MEPN, BTN, MDD, and WVA. One training session was held. ANAR ARES supported the Cherry Pit 10-mile race at S. River High School. OES reports received from N3QXW NU3D W3CA KO4A. ALLE EC KO4UU reports 12 members, 5 net sessions on 146.88 with liaison to MEPN. STMA EC N3RVX reports 25 members, 3 net sessions with liaison to MEPN and packet. I thank all those who have submitted reports and those clubs that have sent their newsletters to your humble SM WB3V. As author of this column, I appreciate all of your input and look forward to hearing about the other events you and your clubs have sponsored. The Maryland Radio Center, in Laurel, Maryland, has closed its doors. Too bad! 73 – Bill. With the nets: Net/net mgr/QND/QTC/QNI: MSN/KC3Y/31/41/259, MEPN/KE3OX/31/91/682, MDD/WJ3K/58/179/266, MDD Top brass K3JL 128, W3YVQ 124, N3DE 117, BTN/AA3LN/31/55/381, SMN/KE3OX/3/3/12, Late entry March MDD/WJ3K/52/150/263, MDD Top brass W3YVQ 146, K3JL 128, N3DE 108, Late entry April MDD/WJ3K/49/124/248, MDD Top Brass W3YVQ 131, K3JL 123, N3DE 83. Tfc: KK3F 500, W3YVQ 125, KE3OX 73, WJ3K 72, N3DE 66, AA3GV 64, KC3Y 58, KB3AMO 56, K3USO 48, N3WK 47, N3WKE 46, N3ZKP 44, KG6TU 26, N3EGF 19, KJ3E 12, WA3WRT 9, WA1QAA 5, N3XKP 5, WA3GYW 2, KE3FL 2, April WJEK 73, PSHR: KK3F 170, W3YVQ 151, KG6TU 133, N3WKE 133, WJ3K 112, KC3Y 107, N3WK 106, KE3OX 105, AA3GV 105, N3ZKP 86, KJ3E 82, WA1QAA 70, April WJ3K 102.

NORTHERN NEW YORK: SM, Les Schmarder, WA2AEA—ASMs: WB2KLD, N2ZMS, WA2RLW ACC: WZ2T. BM: KA2JXI. OOC: N2MX. PICs: N2SZK, WA2RXO. SEC: KF2GC. STM: N2ZGN. TC: N2JKG. Club Officers, Black Fly ARC: KB2E, WA2RP, KB2ZIE, AA2JO, N2UUE. CVARC has achieved SSC status. CVARC Hamfest was again an enjoyable event. Rochester Convention moves to June 4, 5, 6 next year. All operators assisting during the January Ice Storm were officially commended for YOUR outstanding efforts at the Atlantic Division Convention in Rochester. ARRL Officials attending included First VP Steve Mendelsohn, W2ML, VP Hugh Turnbull, W3ABC, Directors Kay Craigie, WT3P; Frank Fallon, N2FF; and Frank Butler W4RH; and several section managers from within and outside the Atlantic Division as well as some ARRL staff. BBS Reports, B/P/T: KA2JXI 1848/584/32, KD2AJ 3734/553/101. Net Reports, QNI/QTC/QND: Bill's Geritol 221/0/21, CARRIER 597/43/26, CVARCCPN 42/3/8, CVARCSN 55/2/5, JCRAC 265/9/17, Lewis Co ARES/RACES 38/0/6, MVARC 29/0/5, NDN 264/12/31, (3 SKYWARN activations) Q NET 489/5/31, SIRR 893/32/31. 73 es GL, Les, WA2AEA.

SOUTHERN NEW JERSEY: SM, Jean Priestley, KA2YKN (@K2AA) e-mail: ka2ykn@arrl.com—ASM: W2BE, K2WB, W2OB, N2OO, KB2TME, SEC: W2HOB. STM: WB2UVB. ACC: KB2ADL. TC: W2EKB. SGL: KB2WKY. BM: KB2GNB. OOC: K2PSC. PIC: N2YAJ. TS: W2PAU, W2BE, AB2Y, K2JF, WB2MNF, KD4HZW, WA2NBL. May 29, 1998, K7UGA, SK. Barry Goldwater, we are proud to have had him as an honorary SJRA member. He paved the way for the VE program, and 10-yr terms. Check the following Web pages: http://www.win.bright.net/~colebdjr/ http://www.eng .tau.ac.il/pages/inter/edp _lab Through a joint effort but most credit going to NNJ, June was proclaimed Amateur Radio Month in 1998. Christie Whitman signed the Proclamation on May 26, 1998. We thank Roy and his staff for a fine job. Also statewide will be the 39th Annual New Jersey QSO Party on August 15 and 16. We would like to hear the airwaves filled. Call or e-mail Roy or me for info. K7VPL, keeps 2 meters scanning locally. He and his XYL saved a heart attack victim. A distress call came and info was passed to police. In just minutes the victim was being treated. The attack was caught in time and only medication needed. SJVN Net daily on 147.345. WB2UVB 204, K2UL 123, WA2CUW 50, W2AZ 41, K2UL-4 34, N2WFN 27, W2HOB-4 20, KA2CQX 16, KB2YJD 12, N2VQA 8, KB2CDB 6, N2FHJ W2HOB 5, KB2VSD N2AYK N2FET 4, N2ZMI KB2RHI KB2VSR KB2YBM N2FHK N2SOE KB2HJJ 1. If you would like to be a part of the NTS, just check onto the SJVN net and ask for WB2UVB.

WESTERN NEW YORK: SM, William Thompson, W2MTA—CONGRATS: W2FS received the May '98 *QST* Cover Plaque Award for his article on page 33. K2SPO reports working Spain across the pond on 6 meters CW. THANKS AGAIN to our many ARES folks for their FB support to National Weather Service's SKYWARN operations and radio services to local government in the tornadic disasters at the end of May. Section leadership officials: (ASMs) K2BCL K2DN K2EY K2MP K2OC K2ZR N2EH W2BCH W2IEG W2LC WA2UKX WY2N; ACC: N2EH (n2eh@frontiernet.net); BM K2KWK (k2kwk@juno.com); SEC K2KIR (k2kir@telenet.net); STM KA2GJV (bzeller@oswego.edu); OOC K2DYB; PICs KB2UQZ (kb2uqz@juno .com) & WA2PUU; SGL N2KYZ (levinrah@norwich.net); TCs K2QR & WB2VUO. APPOINTMENT: (PIO) AA2ED. CLUB OFFICERS: FHARC N2OJI KB4CMF KB2WRP KB2TXR and FHARC Special Service Club renewal. Lancaster ARC lost great Elmer when W2UJR joined ranks of Silent Keys. Hamfests: Batavia@Alexander July 12, UARC@Frankfort July 18, Auburn ARA@Weedsport Aug.1, TCARC@Dryden Aug.8, Rome@ Westmoreland Aug 15, NTS Traffic Handlers Picnic@Elkins WV Aug 22, PROs@Chaffee Aug.22, Greater Buffalo@Depew Aug 23, MOARC, Fly-in Breakfest@Durhamville Aug 30, WNY Convention @Hamburg Fairgrounds Sept19, Elmira@Horseheads Sept.26, RAGS Oct 3.

Net	*QNI*	*QSP*	*QND*	*Net*	*QNI*	*QSP*	*QND*
Early Bird-FM	376	000	021	#STAR-FM	421	020	039
NYS RACES-SSB	086	010	005	#WDN/E-FM	399	058	031
NYS RACES-SSB	086	010	005	#NYS/E-CW	332	134	031
NYS RACES-CW	021	05	005	OMEN-FM	102	000	06
#NYS/M-CW, 3677	208	102	031	ONEONTA-FM	015	005	004
CHN-SSB, 3925	174	050	031	TIGARDS-FM	023	004	004
#WDN/M-FM	454	054	031	BRVSN-FM	301	005	031
#NY PHONE-SSB	253	289	031	#CNYTN-FM	377	081	031
#NYPON-SSB, 3913	278	182	031	#WDN/L-FM	TBD		
ESS-CW, 3590	320	106	031	#NYS/L-CW	248	170	031
NYSPT&EN-SSB	315	049	030				
#OCTEN/E-FM	1250	207	031				

#Denotes NTS net operation.

*Denotes Public Service Honor Roll. Traffic (May): N2LTC*1042, KA2ZNZ*491, KA2GJV 382*, KF1L*300, W2MTA*267, WI2G*246, K2BCL*2234, WB2IJH*188, W2FR*177, NN2H*154, N2CCN*104, WB2QIX*101, K2YAI*100, AF2K*94, KB2WII*69, W2PII*68, KC2CSQ*64, N2OJI*55, KG2D*54, AA2ED*49, KA2DBD*39, N2JRS*33, KC2BYA*32, K2DN*32, W4BNY*30, N8JSO* 16, KB2UQZ*16, KB2ETO*13, N2WDS*11, WA2GUP*9, WA2UKX*8, N2IKR 5, KB2SCF 3, KA2QIK 1. Datalink Reports RX/TX: K2DN 6/4; KA2GJV 87/47; N2LTC 280/146. BPL (May): N2LTC. Enjoy them hot dawg days — SET is coming. 73, w2mta@juno.com.

WESTERN PENNSYLVANIA: SM, Bill Edgar, N3LLR—ASM: N3MSE. ACC: N3SJR. ASM-ARES: WB3KGT. SEC: N3SRJ. ASM-Packet: KE3ED. ASM-Youth & Education: KE3EE. PIC: W3CG. STM: WB8KPE. TC/OOC: WR4W. DEC-SO: KD3OH. DEC-N2: N3NIA. DEC-S1: KA3HUK. DEC-S2: N3PHF. A big THANK YOU and a tip of the hat

Continued on page 114.

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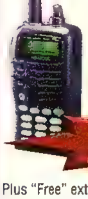

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440 Tiny HT 2Mtr Tiny HT

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(DJ-S41T shown)

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SMA-501 Dual Band

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Shown on the popular FT-50R by Yaesu. The antenna is only 1.75 inches tall, and exhibits surprising performance.

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Dual band Mobile Antenna with flexible whip..

The perfect antenna for high profile vehicles. The heavy-duty whip bends to enter garages, drive-thrus, etc.

Available with a PL-259 connector (SBB-1), or an NMO connector (SBB-1NMO).

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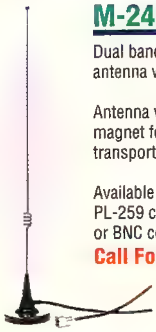

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Dual band 2M/70cm mag mount antenna with 12' RG-58/U coax.

Antenna whip unscrews from the magnet for easy storage and transport.

Available with a soldered-on PL-259 connector (M-24M), or BNC connector (M-24B).

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40/20/17/15/10/6/2 Meter mobile ant.

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- Built-in CTCSS enc./dec.
- Full-sized, backlit keypad
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- Wide receive from 100-174, 340-480, and 850-985 MHz (cellular blocked)
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- CTCSS enc./dec. • CTCSS tone scan

(AR-446 also shown)

AR-146 2M Mobile

- 3 select. pwr. settings (5/10/50w)
- 40 memories plus a CALL channel
- Built-in CTCSS encode/decode
- Wide receive cov. 130-180 MHz

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40' Tubular Tower

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55' Tubular Tower
Handles 10 sq.ft. at 50mph
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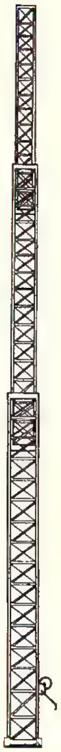

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reads true RF impedance . . . Super easy-to-use

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New!

MFJ-259B $\$239^{95}$

Theworld's most popular SWR Analyzer just got better at no extra cost!

Only MFJ reads SWR and true RF impedance from 1.8 to 170 MHz on dual meters. It's also an accurate frequency counter. *New features* include LCD digital readout that displays frequency, SWR and impedance or SWR bargraph simultaneously, Ni-Cad battery charger, easy-access battery panel and battery saver. Smooth reduction drive tuning makes tuning easy.

What the MFJ-259B Does

The MFJ-259B gives you a complete picture of your antenna's performance anywhere between 1.8 and 170 MHz -- you can even check SWR outside the ham bands without violating FCC rules. Set the bandswitch and tune the dial--just like your transceiver. SWR is displayed instantly!

True RF Impedance Meter™

Does 2:1 SWR mean 25 ohms or 100 ohms? *The new MFJ-259B tells you at a glance!*

Now you can measure RF resistance up to 500 ohms at minimum SWR -- instantly -- on MFJ's *exclusive* side-by-side RF Resistance and SWR Meters!

Take the guesswork out of building matching networks and baluns for your antennas.

Watch the effects of spacing on radiation resistance as you adjust your antenna.

Here's What You Can Do . . .

Find your antenna's true resonant frequency from the shack.

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Tune critical HF mobile antennas in seconds -- without subjecting your transceiver to high SWR.

Measure your antenna's 2:1 SWR bandwidth on a single band, or analyze multiband performance over the entire spectrum from1.8 to 170 MHz!

Measure inductance, capacitance, resonant frequency of tuned circuits, transmission line velocity factor/impedance/loss.Test RF chokes, transformers, baluns.

Adjust your tuner for a perfect 1:1 match without creating QRM.

And this is only the beginning! The MFJ-259B is really *four* test instruments in one: an accurate RF signal generator, a high resolution 170 MHz frequency counter, *RF Resistance Meter*™ and an *SWR Analyzer*™.

Free Manual

MFJ comprehensive 18 page instruction manual is packed with useful applications -- all explained in simple language you can understand!

For free manual write or call MFJ.

Take It Anywhere

The MFJ-259B is fully portable, powered internally by 10 AA batteries or 110 VAC with MFJ-1315, $14.95. It's in a rugged all metal cabinet that's a compact 4x2$^1/_2$x6$^3/_4$ inches. Take it to remote sites, up towers, on DX-peditions -- anywhere your antennas are located.

How Good is the MFJ-259B?

MFJ SWR Analyzers™ work so good, many antenna manufacturers use them in their lab and on the production line -- saving thousands of dollars in instrumentation costs! Professional installers and technicians use them worldwide.

Get More by Paying Less

You get full 1.8 to 170 MHz coverage, simple operation, instantaneous readings, a frequency counter and MFJ's RF Impedance Meter™-- all for a low $239.95.

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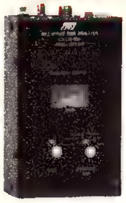

MFJ-249 $\$219^{95}$

MFJ-249 *HF/VHF SWR Analyzer*™. Same as MFJ-259 but less RF resistance meter. Includes 10-digit LCD frequency counter, *full* 1.8-170 MHz coverage and smooth vernier tuning.

MFJ-209 $\$129^{95}$

MFJ-209 *HF/VHF SWR Analyzer*™ is same as MFJ-259 without LCD frequency counter and RF resistance meter. Has jack for external frequency counter, smooth vernier tuning.

Carrying Pouch with Window

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Tote your MFJ-259B /249/209 *SWR Analyzer*™ anywhere with this custom Carrying Pouch. Made with a special foam-filled fabric, it cushions blows, deflects scrapes, and protects knobs, meters and displays from harm.

Clear protective frequency display and window cutouts for knobs let you use it without taking it out of pouch. Fully adjustable webbed fabric carrying strap has snap hooks on both ends. Wear around waist or over shoulder. **Keep** your analyzer safe and looking new!

MFJ-29, $19.95, no window or cutouts.

Dip Meter Adapter

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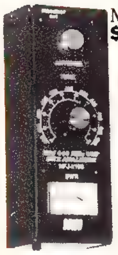
Plug a dip meter coupling coil into your *MFJ SWR Analyzer*™ and turn it into a sensitive and accurate bandswitched dip meter.

With a dip meter you'll save time and take the guesswork out of winding coils, measuring inductance and capacitance, measuring velocity factor and electrical lengths of coax. Determine resonant frequency of tuned circuits and measure Q of coils. Set of two coils cover 1.8-170 MHz depending on your *MFJ SWR Analyzer*™.

440 MHz SWR Analyzer™



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Read SWR of any antenna 420 to 450 MHz -- just plug coax of your antenna into SO-239 connector, set frequency and read SWR. Uses microwave integrated circuits and microstrip technology. Jack for external frequency counter. 7$^1/_2$x2$^1/_2$x2$^1/_4$ in.

MFJ-219B uses 9 volt battery or 110 VAC with MFJ-1312B, $12.95

Comes with free "N" to SO-239 adapter for UHF coax connectors.

MFJ 2 Meter FM *SignalAnalyzer* ™

Measure signal strength over 60dB range - Check and set FM deviation - Measure antenna gain, beamwidth, front-to-back ratio, sidelobes, feedline loss in dB - Analyze audio quality with scope

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MFJ-224 $\$159^{95}$

MFJ's revolutionary handheld 2 Meter *FM SignalAnalyzer*™ lets you measure signal strength with over 60 dB dynamic range; check and set FM deviation of your packet and voice radios; measure antenna gain, beamwidth, front-to-back ratio, sidelobe suppression and actual feedline loss in dB.

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You can tune in any signal between 143.5 and 148.5 MHz. It's built-in discriminator-meter function makes accurate tuning simple and easy.

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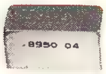

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KWM2/A ......Complete tube kit, no 6146W's: $100
32S-1F ....Complete tube kit w/6146's: $149
32S-3F ....Complete tube kit w/6146's: $149
51S-1 ....Complete tube kit: $115
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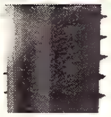
75S-3 ....Complete tube kit: $100
4D32 ....Trans. Tube, Fits 32V-1, 32V-2, 32V-3: $20

TUBE SPECIALS



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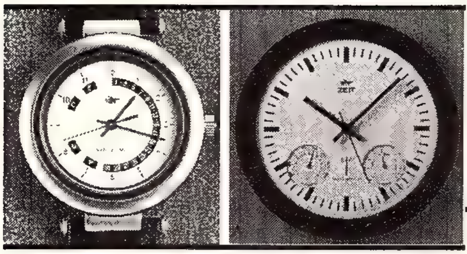

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goes to Stew Saylor, AK3J, for his years of good service as the WPA Section Affiliated Club Coordinator. Stew resigned in June as our ACC due to increasing family duties and job duties. A number of our section's amateur clubs benefited from Stew's guidance. I am pleased to announce that Twila Kerr, N3SJR, has been appointed as our section's Affiliated Club Coordinator. Twila has been very involved with the Indiana County Amateur Radio Club. In this appointment, Twila will be our section's resource for clubs wishing to affiliate with the ARRL; club ARRL affiliation renewal; Special Service Club applications and renewals. May 31 and June 2 brought severe weather to our section. Thirteen counties within our section had reported tornado damage, while other counties reported severe wind damage. Amateur Radio operators rose to the occasion to provide communications to the Weather Service, Red Cross and other public service agencies. A tip of the hat to those assisting! The Amateur Radio Emergency Service is looking for more interested people to assist in circumstances such as this. If you have an interest, please get in touch with your local ARES Emergency Coordinator or contact Rich Beaver, N3SRJ WPA Section Emergency Coordinator, 907 Arlington St, Janet, PA 15644. May 1998 Traffic Reports: Station, QTC, PSHR Total; W3OKN, 160, 128; N3COR, 120; W3NGO 90; N3ON, 73; WA3UNX, 70; W3GJ, 42; N3WAV, 28, 108; N3KB, 27; KC3NY, 18; N3PBD, 17, WB8KPE, 16; WA3QNT, 9. Traffic Net, Mgr, QTC, Sessions; WPA Phone, N3KB, 111, 31; WPA CW, N3COR, 82, 30; NWPA2MTN, WA3ZSC, 28, 28; WPA2MTN, KA3BGC, 27, 31; Erie Mailbag, N3PBD, 11, 19, 73, Bill Edgar, N3LLR, WPA-SM.

CENTRAL DIVISION

ILLINOIS: SM, Bruce Boston, KD9UL—SEC: W9QBH. SGL: WA9AQN. ACC: N9KP. STM: K9CNP. PIC: N9EWA. TC: N9RF. OOC: KB9FBI. Regular mailings from HQ are just one of the many perks that clubs receive when they become affiliated with the League. If your group is affiliated but you aren't getting material from the ARRL, that could mean HQ hasn't received the required annual report form from your club. Affiliated clubs are considered inactive and all mailings stop when HQ doesn't receive the annual update. So, make sure your group is on the active list and start enjoying those perks again by submitting the affiliated club annual report form. The form can be requested from HQ, or Internet users can complete the form on-line by visiting www.qsl.net/kd9ul or the main ARRL Web site. Thanks to WA9APQ for sending a copy of the Shawnee ARA newsletter. WA9APQ reports that amateurs in southern IL provided communications in support of the River to River Runners relay race. Plans are already underway to provide support for the event again next year. The Lewis and Clark RC, DuPage ARC, and the York RC have been officially renewed as Special Service Clubs. Section Traffic Manager K9CNP reports that the activity on the late section net (10:00 PM local time) has been virtually zero for the past year. As a result, it was decided to close the 10 PM net operation as of June 1. EC WA9RUM reports that 3 trained weather spotters confirmed funnel activity that was indicated by NWS radar on May 12. The ARRL Executive Committee has approved the holding of an ARRL W9DXCC Operating Specialty Convention on Sept 12 in Rolling Meadows under the sponsorship of the Northern IL DX Assn. N9BOR reports that mail reflector for Amateur Radio operators in Illinois is now in operation. To subscribe to the reflector, send e-mail to majordomo@qth.net and leave the subject blank. In the body of the message type "subscribe ilham" then press send. The Lamoine Emergency ARC in Macomb has a mail reflector of their own. If you would like to subscribe to it send e-mail to majordomo@qth.net with the subject blank and the words "subscribe learc" in the message are a. Members of LEARC took part in a simulated tornado disaster as part of a Red Cross exercise in Carthage. LEARC members also assisted the Salvation Army canteen during a rescue and recovery operation. Congratulations to KB9AKD on his appointment as the new police chief of Macomb.

Net	*Freq*	*Time (Local)*
ISN	3.905	1800 Daily
ILN	3.665	1830 Daily
ITN	3.680	1900 Daily
CTN	147.090+	2100 Daily
IL ARES	3.905	1630 1st & 3rd Sunday
Macon Co	442.250+	2100 Wednesday
IEN	3.940	0800 Sunday
IPN	3.856	1645 M-F; 3.940 at 0815 Sunday
NCPN	3.912	0700 M-Sa; 7.270 at 1215 M-Sat

Tfc: W9HLX 187, K9CNP 149, KA9IMX 43, N9DT 42, NS9F 40, WB9TVD 33, NC9T 20, W9FIF 13, WA9RUM 6. ISN Report de WB9TVD: QNI 188, QTC 62, Sessions 28. ILN via K9CNP QTC 35 in 60 sessions, ITN via KF9ME QTC 19 in 29 sessions, NCPN via W9OUF QTC 79 in 26 sessions, IPN via KA9CYJ QTC 6 in 26 sessions, IEN via K9HEZ QTC 2 in 4 sessions. May traffic: K9CNP 138, W9HLX 105, KA9IMX 43, WB9TVD 38, W9FIF 8, WA9RUM 7. W9VEY Memorial Net de K9AXS 175 with 6 check-ins. ISN via WB9TVD 73 in 31 sess. ILN via K9CNP 43 in 62 sess. ITN via KF9ME 15 in 29 sess. NCPN via W9OUF 42 in 26 sess. IPN via KA9CYJ 21 in 24 sess. IEN via K9HEZ 2 in 5 sess. Ninth region report for May tfc 382-sess 62-425 min-avg 6.16-rate .898. Rep 98%. QNI-ILN K9CNP KF9ME NS9F.

INDIANA: SM, Peggy Coulter, W9JUJ—SEC: K9ZBM. ASEC, WA9ZCE. STM: AA9HN. OOC: KA9RNY. SGL: WA9VQO. TC: W9MWY. BM: KA9QWC. ACC: N9RG. Sympathy extended to the families and friends of Silent Keys ; 5/1, Jerrold L. Colten, W9CZI, South Bend; 5/10, Lyle J. Hamman, WA9WTH, Fort Wayne; 5/19, Hershel J. Mullins, KF9SC, LaGrange. They will be missed. The Lake Co. ARC provided communications for the Red Cross Run/Walk in Wicker Park. Those helping were W9ZRO, KF9GW, and KF9EX. They also furnished communication for the March of Dimes WalkAmerica. those helping were WB9VRG, KB9NSD, WN9Z, N9QLS, N9NIC, KB9ODN, KB9MUZ, N9DMA and W9ZRO. If interested in CW and wanting to improve your speed the Sloppy Code Net is still running on Sundays at 0200 UTC (9 PM ET) on 7.1405 MHz. This CW net's purpose is to build confidence and help increase code speed. The speed is generally 1 -10 WPM. If you want to copy only contact Henry, KA9ZNN at 219-749-8968 for

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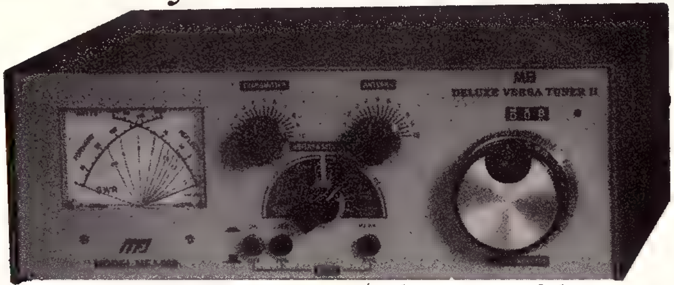

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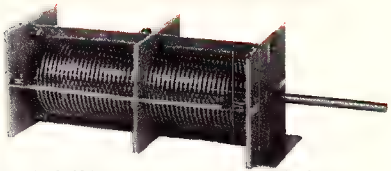

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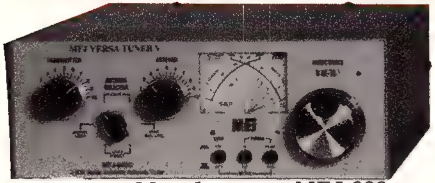

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details. If anyone has anything of interest for the ham community please send to me. Congratulations to the TRI State ARS which has officially been renewed as an SSC. NM's ITN/W9ZY, QIN/WB9TUS, ICN/AA9HN, WN/WA9OHX, VHF/AA9HN.

Net	*Freq*	*Time/Daily/UTC*	*QNI*	*QTC*	*QTR*	*Sess*
ITN	3910	1330/2130/2300	2343	468	1567	93
QIN	3656	1430/0000	251	81	584	48
ICN	3705	2315	103	28	477	31
IWN	3910	1310	2321	–	310	31
IWN VHF Bloomington			476	–	465	31
IWN VHF Kokomo			710	–	155	31
IWN VHF Northeast			919	–	620	31
Hoosier VHF nets			756	64	1213	60

9RN April total tfc 316 in 59 sessions IN represented by WB9TUS, KO9D, K9PUI, KJ9J, AA9HN, WB9UYU, WA9QCF, and W9FC. May total tfc 382 in 62 sessions IN represented by KO9D, WB9TUS, K9PUI, WA9QCF, AA9HN, N9HZ, WB9UYU and W9FC. Tfc: W9FC 344, KJ9J 119, K9PUI 118, K9GBR 113, W9ZY 90, WB9QPA 72, AB9AA 61, KO9D 58, W9UEM 53, W9JUJ 52, KB9NPU 41, KA9EIV 41, WA9QCF 31, N9WNH 26, KA9DIG 25, KA9QWC 22, AA9HN 20, N9ZZD 12, K9RPZ 12, N9JAI 9, W9CSJ 8, W9EHY 8, W9BRW 8, WB9NCE 6, K9DIY 6, KB9WI 3, AB9A 3, W9FC (Apr) 307.

WISCONSIN: SM, Roy A. Pedersen, K9FHI—BWN 3985 0600 W9RCW. BEN 3985 1200 KE9VU. WSBN 3985 1730 WB9WHQ. WNN 3723 1800 KB9OCZ. WSSN 3645 1830 N9BDL. WIN-E 3662 1900 WB9ICH. WIN-L 3662 2200 W9UW. Did you contact any of the special-event stations in Wisconsin? Propagation was very poor. New EC for Outagamie County is N9ZXR. (QSO-R). Fond du Lac radio club provided communications for the bike-a-thon, which was held May 2, good going guys and gals. (FDL club) Ralph and Bernice Woida (WS9N) celebrated their 57th wedding anniversary, Art and Nancy Kasten (N9SOM) celebrated their 52nd. Congratulations. (Hamtrix) 9RN,c 4 checkins from Wisconsin are, W9UW, N9CK, W9YCV, W9CBE, and K9LGU. Thanks guys. Sorry to report W9OJT, W9FIO, W9COG and W9BCC as Silent Keys. KB9QLU is now KG9NH and has Amateur Extra license.(Ozaires) Hams from the Ozaukee ARC have been busy with, Vietnam Wall Parade, Tour de Care and Riverfest. (ORC newsletter) 9RN 1-2 needs more participation from Wisconsin, come on guys let's have a little cooperation. I sure wish people would send me things of interest for this column. Thanks to all those clubs who send me their newsletters. I really appreciate it, I do pick out articles that are good for the column and credit is given to that newsletter. I hope you had a good time over the holiday weekend. A group of 7 ham families camped out in central Wisconsin over the holiday weekend, if you like to camp and want to be with a fun group, let me know, we always have fun. There are a number of swapfests coming up; maybe I will see some of you at these doings. I know conditions of propagation have been bad, but try to check the nets, someone will relay you in. We need more traffic too, send a radiogram to someone for their birthday, anniversary, etc. Have a good summer. Tfc: K9JPS 1302, WB9JSW 697, W9RCW 646, W9CBE 328, WB9YPY 312, W9YCV 140, K9RTB 124, N9KHD 105, KA9KLZ 93, K9FHI 89, N9BDL 81, N9CK 81, W9UW 66, KE9VU 61, KG9B 39, KA9BHL 38, KE9LX 32, K9HDF 31, K9LGU 28, K9GU 26, WB9ICH 25, K9PQ 24, N9JIY 22, W9ODV 19, WD9FLJ 9, W9PVD 3.

DAKOTA DIVISION

MINNESOTA: SM, Randy "Max" Wendel, N0FKU—I write this on the heels of having been without ac power for 5 days from storm system that also affected Spencer, SD. I happened to pass thru St Peter day after storm and grabbed the generator from my folks, which they used for 2 weeks after the tornado. It sure came in handy! Even managed to save my tropical fish in both tanks. Days without ac power sure curves one's lifestyle. I'm used to not going to bed until 11 PM at night. Without ac power, it was 9:30 and a cold waterbed! Between that and another storm, I had broken windows, hail damage to house/garage, etc. However, the veggie garden still came thru! Waseca (Viking) ARS reports their Hamfest and Craft Fair is Aug 15 at 8 PM at the fairgrounds, located just east of the old location that was the high school. Call Lloyd Schlaak n0vfv@smig.net or 507-465-8619 for info. Talk in on 146.94. I received word from ARRL that no other nominations were received for next term as SM so looks like I'll be serving next term starting Oct.1. I've served since 1992 and have enjoyed every minute of it. Remember, it is YOU folks who make the decision who should wear the SM hat and orchestrate the functions of the field organization. This includes the ARES structure, amateur auxiliary and others. We always seek volunteers who may be able to play a role in the FO and help us reach forward in the ham radio and public community as a service. Good volunteers seem hard to come by at times. Even clubs seem to have difficult times staying glued due to lack of participation by their members within. Everyone should give to their organization or club and support the fundamental purpose thereof. If you join looking for pure pleasure of seeking entertainment, you won't find it. Remember the proverb "give and ye shall receive." It goes without saying in a radio club/organization as well. Don't forget your club officers and newsletter editors, they give thanklessly all the time. Meanwhile, August marks 5 years in the ol' house here in Bloomington. Seems like I just put the tower up! Hope you're enjoying summer. 73 for now from your section manager, de N0FKU. Tfc: WB0WNJ, KB0AII, WA0TFC, W0LAW, K0PIZ, W0HPD, W0GRW, K0WPK, KB0AIJ, W0WVO, KN9U, KA0IZA, W3FAF, WD0GUF, K0OGI, KB0OHI, N0JP.

NORTH DAKOTA: SM, Bill Kurtti, WC0M— I am sorry to report that KA0KTJ, K0BEA & N0BCW are Silent Keys, Adalph was active in the Aneta Area. K0BEA & N0BCW were natives of ND but left the state after they received their licenses. We enjoyed the Mayville Picnic about 50 attended. Congratulations to N0JCT on winning the traveling trophy for his enthusiasm in ham radio. The FORX club in Grand Forks provided communications for the MS walk around GF, when the weather turned for the worst near the end of the event the 15 hams provided the necessarily communications to ensure that everyone was accounted for & safe. Also from GF congratulations to Larry & Ron for

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When you get there, set it on a table or desk and enjoy ragchewing or DXing.

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catching the 1st rabbit of the season. TRARC (Dickinson) club got an early start on SKYWARN with several supercells & a twister 25 miles south of Dickinson on May 11. I suggest to Vern, N0MVN, that he not wear that headgear in the woods as a Cow Moose may fall in love with him. Net/sess/QNI/QTC. Goose River 4/60/2; DATA 26/432/33, Storm Net 3937 (continues during storms only) If conditions bad on 3937, try 7232.

SOUTH DAKOTA: SM, R. L. Cory, W0YMB—N0IGP and the Prairie Dog Amateur Radio Club is sponsoring a South Dakota QSO party the last weekend in August. Check *QST* for details – awards will be given. A long-time South Dakota Ham, W0URD, Clarence Jacobs, became a Silent Key. He had moved to Alaska. Lark Club at Watertown has a busy summer planned. They will furnish communications for a walk-run sponsored by Prairie Lakes Hospital on July 13. July 4, a parade at Watertown, July 4-5, special-event station from the Laura Ingalls Wilder Pageant at DeSmet, and a mini-marathon by the Watertown Boys and Girls Club in July and Sept. Black Hills hams recently provided communications for an MS walk in Rapid City. Hams tracked down a few lost walkers and coordinated lifts back to the starting point for some that could not make the distance. Aberdeen Club reports six new Technician class hams. Combined Dakota Div Midwest Div Convention at Sioux City is now history. Attendance was 800 and the 3900 Club put on an excellent convention. Total Traffic is 614.

DELTA DIVISION

ARKANSAS: SM, Roger Gray, N5QS, e-mail n5qs@arrl.org—I must apologize for missing last month. I always wait for the last minute to get any news that comes up due to the long lead time (it is now the middle of June) and this time unforeseen events prevented me from making my deadline for this article. Since my last report, I attended the Arkansas ARRL State Convention and had a very good time and made many new friends. The hamfest was well attended and everyone seemed to have a good time. I am making plans for Field Day now, and plan to visit several sites. I hope everyone has a safe and enjoyable time this year. It is time now for school to begin and for the leaders of the clubs around the state to plan activities to encourage the youth in our state to join our hobby. I plan to visit several schools in the coming months. At schools I have recently visited, I have changed my presentation to show how a hobby that is a lot of fun can lead to a very enjoyable and profitable career. I used this approach at a career day first and got a very enthusiastic response from the students. The others presenting topics were trying to convince the students to work in their fields and many had no interest in "work." The thought of using your hobby to earn a living got a very good response. Think about this next time you talk to a group of young people. Tfc: W5RIT 68. PSHR: W5RIT 95.

LOUISIANA: SM, Lionel A "Al" Oubre, K5DPG, e-mail k5dpg@arrl.org Web Page www.aisp.net/k5dpg ASM: KB5CX. K5MC. ACC: KA5IJU. BM: K5ARH. TC: KE5FZ. SEC: N5MYH. OOC: WB5CXJ. PRC KB5QVI. STM: KG5GE. NM LTN: WB5ZED. NM LSN: W5CDX. NM LCW: W4DLZ. The section's affiliated and Special Service Clubs need to check to be sure that the Annual Reports are being submitted. If you have access to the internet, reports can be electronically submitted. The URL is: http://www.arrl.org/field/club/ If you are not on the Internet, you can contact the ACC, KA5IJU, for the status of your club. As I write this, we are in the firm grip of summer. Severe weather has been abundant. Hopefully the real severe weather will not be a problem. Thanks to all who check into the traffic nets, especially the region nets. Our section has been represented 100% for several months in a row. Up coming hamfests are: Shreveport August 8-9, NO IDXC August 14-15, Alexandria Sept 19, Monroe Nov 7. Louisiana section net schedule: LTN 6:30 PM, 3910 kHz nightly, WB5ZED mgr; LCW 6:45 PM, 3673 kHz nightly W4DLZ, mgr. LSN 8:30 PM, local 3713 kHz Mon-Fri, W5CDX mgr/KK5WG asst. Reports for May 1998: LTN QNI 387 QTC 117 in 31 SESSIONS, LSN QNI 71 QTC 14 in 21 sess, DRN5 LA represented 100% by KG5GE, K5WOD, K5IQZ, WA5LHL, WB5ZED,WB5CDX, N0KWA, K5AZR, WA5YJW, K5DPG. RN5 LA represented 100% by K5MC, W5NK, WB5CDX, W4DLZ. PSHR: N0KWA 88, K5WOD 96, K5MC 100, KG5GE 109, K5IQZ 122, K5DPG 132, W5CDX 138, WB5ZED 156. Tfc: K5WOD 4, N0KWA 16, KG5GE 22, K5DPG 22, K5MC 70, K5IQZ 105, W5CDX 164, WB5ZED 165.

MISSISSIPPI: SM, Malcolm Keown, W5XX—ASM: AB5YY. ACC: N5JGK. BM: W5EPW. STM: KD5P. NM: AB5YY, KB5W, N4VHX, N5YNY, KI5UK, KB5WJJ, KB5IXI. Welcome to new section appointees: ACC: N5JGK. EC: KK5BY, KC5ZEA. ORS: K5VV, KT5Z, and PIO: AC5E. Congratulations to the Magnolia DX Association (and condolences?) for being selected to operate the W5 QSL Bureau. N5FG is the manager. In preparation for the AMSAT-NA Symposium in Vicksburg, N5JGK, KC5DNY, and WB5SXK conducted satellite demos at the Tupelo, Lafayette, and Natchez Hamfests. Mississippi hams are starting to get new license plates as renewals come up thanks to the efforts of W5OXA, N5YFR, N5VEI, and KK5BY. Congratulations to "Team Mississippi" (K6MG, KB5IXI, K5ZK, N5FG (WQ5L op), and W5XX) for placing 13th out of 30 nationwide team entries in the January CW North American QSO Party. Net reports: sessions/QNI/QTC. MSPN: 31/2367/67, MTN: 31/207/89, PBRA: 31/758/1, JCARES: 30/507/32, MSSN: 21/73/2, MLEN: 5/105/0, LARC: 4/68/0, AMSAT: 4/27/0, MBHN: 5/18/0. MSN 31/1100/11. OO Report: K5XQ. PSHR: KD5P 108, K5DMC 74. Traffic: KB5W 345, K5DMC 120, KD5P 90, N5XGI 69, W5XX 2.

TENNESSEE: SM, O.D. Keaton, WA4GLS—ACC: WA4GLS. ASM: WB4DYJ. PIC: W4TYU. SEC: WD4JJ. STM: WA4HKU. OOC: AD4LO. TC: KB4LJV. More than 50 ARES members responded to the call of O.E.M. on April 16, 1998 immediately after the tornadoes struck Nashville. The Red Cross asked for Amateur Radio operators to assist it in its relief activities, not only did the local ARES members send support, but other middle Tennessee hams responded to the call. Thanks to all who had a part in assisting with the relief efforts, you did a great job. Gary Churchwell, K4NRI, is new EC for West Sullivan County. Thanks to *The Zero Beat* for listing the Tennessee Traffic Net Schedule every month, gives every one a reminder to meet the nets and handle traffic. DELTA club members came through again, Harmon Sharp, K4WWQ, 84 years of age needed assistance in getting an antenna up, so Dave Goggio, W4OGG,

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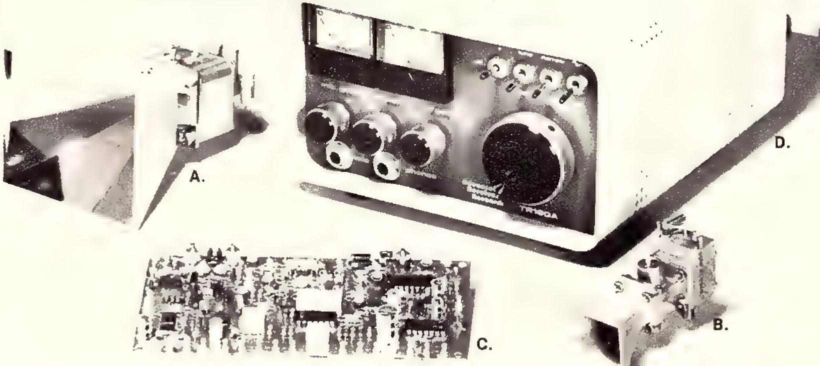

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asked for help in this chore and Ned, KA4BLL; Robin, KE4GPR; and David, KD4NOQ; stepped forward to get Harman on the air. Hams helping Hams is what this is, there should be more of it. Ron Mott, W4RDM; and Bill Phillips, WD4KQV; reported that ARES and SKYWARN groups in Southern Middle Tenn. were very active tracking tornadoes on April 16, these activities were reported in MARC news. The following hams assisted the Johnson City March of Dimes WalkAmerica, KB4ZVA, W4NHT, K4ZHK, KU4QZ, KD4QZ, WX4S, KD4RNC, KD4MIE, KB4NVD, KT4OR, KF4ZTF, N4IYQ, N4OFA, AC4LS, KD4EDL, KC4YCQ, K4SE, and WA4UCI. The weather was excellent and all went well. RACK members N4RPQ, KD4BXH, WB3JKQ, KE4HSM, KD4VYK and KF4AHW assisted the MS WALKATHON in Knoxville. According to, *The Rat'sTale*, the RATS regular meeting had 41 in attendance. The Certificate of Gratitude presented to BARC, for its members assistance during recent floods, by the Red Cross pictured the old covered bridge crossing the Doe River in Elizabethton. The ORARC's 1998 Hamfest was a big success, thanks to Hamfest Chairman KB4UMM. Net sess/QTC/QNI: TMPN 31/26/2107; TCWN 24/26/174; TEMPN 21/26/630; TEPN 25/107/2086; TSCWN 19/2/47.Tfc: WA4HKU 66, N4PU 63, WB4GIJ 58, WB4DYJ 37, W4SQE 32, KA5KDB 31, WD4JJ 21, W4HZD 18, WA4GZZ 11, W4PSN 4, W4IKK 2, N4ZXM 2.

GREAT LAKES DIVISION

KENTUCKY: SM. Bill Uschan, KC4MIS—ASM: Tom Lykins, K4LID. PIC: Steve McCallum, W2ZBY. ACC: John Embry, K4AT. SEC: Craig Still, KD4PWP. STM: John Farler, K4AVX. SGL: Ron Landrum, KM4DX. BM: Ernie Pridemore, KC4IVG. TC: Scotty Thompson, KI4AT. We all need to stand together to block the take over of our 70 cm. band by LMCC. This is a real threat and may be a sample of what the future might bring. The Greater Louisville Hamfest will be September 19, 1998, at the Fair and Exposition Center. Just one day this year. I was glad to see everyone at the Northern KY Hamfest. Severe weather spotters have gotten a workout this spring. I don't have the stats on what went on, but SKYWARN has had a busy spring. We are still searching for an ASM in charge of youth activities in the section. If you know of a high school student that would like this position please contact the section manager. It is with regret that we mention that KA8HBN, Sam. Bernstein, became an SK earlier this month. The Bowling Green Hamfest will be held August 1, 1998, at the Knights of Columbus Hall on Searcy Dr. Hopefully, there will be good attendance for this Hamfest. The KY State EOC will soon have a top notch MARS station going on the air. The CARS club in Frankfort is in the process of installing new HF antennas and the MARS group will soon be working on new antennas for the Harris HF radios. I just learned that the ARRL has asked the FCC to dismiss immediately efforts by LMCC to gain 420-430 MHz and 430-450 MHz. Hopefully this siege on our VHF and UHF frequencies will be over soon. Tfc: K4AVX 70, KA4BCM 30, N4GD 43, WA4HLW 3, KO4OL 12, KD4PWK 3, KF4RBK 33, WB4ZDU 10.

MICHIGAN: SM, Dick Mondro, WA4FQT (wa4fqt@arrl.org)—ASM: Roger Edwards, WB8WJV (wb8wjv@centuryinter.net). ASM: John LaRock, K8XD (k8xd@voyager.net). SEC: Deborah Kirkbride, KA8YKK (ka8ykk@ concentric .net). STM: Dale Cryderman, KA9EIZ (wcryder222@juno.com). ACC: Mike Pearsall, N8MP (n8mp@concentric.net). OOC: Mark Drolias, N8IQX (mdrolias@gatecom.com). PIC: James (Erv) Bates, W8ERV (kb8tnq@voyager.net). SGL: Ed Hude, WA8QJE (edhude@juno.com). TC: Dave Smith, W8YZ (dsmith@smithassoc.com). VHF/UHF Net Manager: Paul Harmer, KB8ZDV. Section Newsletter Editor: Dave Colangelo, KB8RJI (dcolangelo@ameritech.net. How many past or present youth workers read this column? I'm referring to scout leaders, 4-H leaders, church youth group leaders, teachers, etc. WE NEED YOU! Yes, our youth program in the section is very important to us and we cannot seem to get enough of you to volunteer some time to help in your community. Our assistant section manager for youth activities is one person who has been putting in a lot of time and effort to formulate programs and get some of you involved. He has talked to clubs with very little help being offered. Some of you have put in a lot of time in past years and feel that perhaps someone else will do it. It's just not happening and I appeal to those of you that can help to please contact John, K8XD (listed above) and offer your support. If you could just be a club contact person, or if you have a little more time, you could coordinate activities at a county level. It doesn't pay well at all if you are looking for dollars, but it is an investment in our youth, our leaders of the future. It does pay extremely well in the rewards such as a smiling face, because you care enough to devote some time to their causes, or the thanks you get several years later when you realize that you helped to get someone motivated to become a community leader. Grandparents, this is for you too. You can never lose with an investment in our future. Won't you please help? I am so convinced in the importance of our youth programs, from my own personal experiences, that I would like to issue a challenge to any club to put together and get a new youth program in place, and I will write an article highlighting your program with photographs in our section newsletter, if you wish. If more than one club starts a new program...same thing. Some more incentive for you, just take a look at the photographs on page 20 of last month's (July) *QST*. Look at the smiling faces and sense of pride, especially the two four-year-olds that just got their ticket. Wow...just not enough words in our language to describe it. Good luck! Congratulations go out to John (K8XD) & Mary (KC8FCX) LaRock as well as their son Christopher (KC8AYF) who recently was honored with the rank of Eagle Scout, at a Court of Honor in Tawas City. I was proud to be there as well. Great job Chris! 73, Dick, WA4FQT. Please support the following NTS Nets. May 1998 NTS Net Reports:

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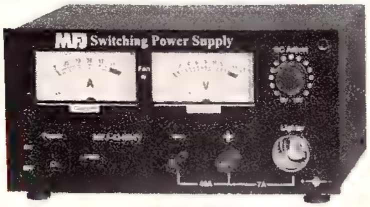

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You get an easy access front-panel with five-way binding posts for heavy duty use and a cigarette lighter socket for mobile accessories. The MFJ-4245MV has two sets of quick-connects on the rear for accessories.

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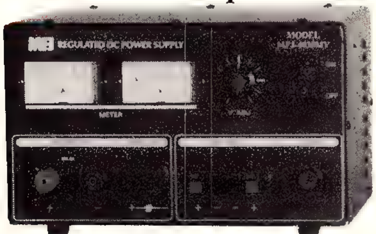

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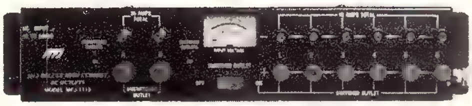

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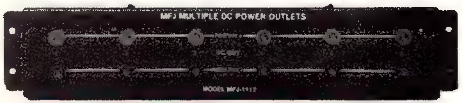

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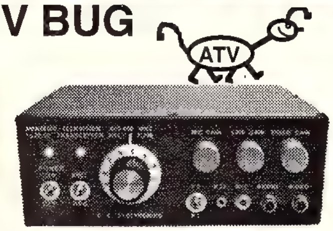

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QMN	741	243	62	WB8SIW	3.663	6:30&10 PM	Daily
MACS	307	97	31	W8RNQ	3.953	11 AM	Daily (1 PM Sun.)
MITN	453	134	31	KA9EIZ	3.952	7 PM	Daily
UPN	1320	59	36	WA8DHB	3.921	5 PM	Daily (Noon Sun.)
GLETN	540	67	31	VE3SCY	3.932	9 PM	Daily
SEMTN	355	92	31	WI8K	145.330	10:15 PM	Daily
WSSBN	721	37	31	K8JRE	3.935	7 PM	Daily
ARAHH	65	05	4	KC8DAJ	145.130	8 PM	Wed
NCN	165	09	20	WD7G	146.940	7:30 PM	M-F
TATN	73	13	10	KC8FXF	147.300	9:30 PM	Daily
VHF	372	18	77	KB8ZDV	Various		

Tfc: N8FPN 135, WX8Y 124, KB8ZYY 113, KA9EIZ 112, KB8HGM 90, K8LG 83,W8RTN 82, K8GXV 66, N8TDE 60, WR8F 51, W8RNQ 51, WA8DHB 46, WA8JXG 40, K3UWO 37, K8UPE 31, K8AI 30, K8ZJU 24, K8XD 24, K8JN 23; N8OSC 18, WB8YIQ 17, KC8GRP 17, KC8GMT 17, WD8OEP 12; AA8SN 11, NJ8R 10; N8JGS 6, WB8WJV 6, K8LAR 4, W8YZ 3.

OHIO: SM, David Kersten, N8AUH@W8IZ (see p 12) or dave.kersten@irmg.com—ASM, John Haungs, WA8STX 513-782-6464. ASM (Packet): Steve Wolf, W8IZ@W8IZ. SEC: Larry Solak, WD8MPV , 330-274-8240. STM: Jack Wagoner, WB8FSV, fsv@netwalk.com; ACC: Joanne Solak, KJ3O/8; 330-274-8240. BM: John Schlueter, W8WYH@W8BI. TC: John Fakan, KB8MU. SGL: Paul Krugh, N2NS@W8CQK. PIC: Beverly Priest, N8VZV, mapriest@erinet.com. OOC: Paul LaFollette, Jr. wb8ona@ worldnet.att.net. I'm pleased to announce the renewal of several more Special Service Clubs: Northern Ohio ARS and Marion ARC. Thanks to all for your great service to Amateur Radio! The work done by these and other Special Service Clubs helps our hobby grow and build a good reputation. If your club isn't Special Service, why not contact Joanne, KJ3O/8, and ask her what can be done so your club can attain that distinction? Her phone number is shown above. Buckeye Belles elected new officers not long ago: pres, N8MZJ; vp, KC8BOM; treas, KB8VYB and secty, N8QMV. Congratulations! John Ness, WB8SFV, has been named Ham of the Year by IARC of Mansfield. Congratulations for being so honored by your group, John! The Annual Ohio Section Conference will be later this month. The Conference will again be held in Columbus and will be the weekend of August 22. The July issue of the *Ohio Section Journal* contains details including location, specifics about speakers, presentation times, etc. If you need this information and you don't have your OSJ handy, please contact me or Larry Solak, WD8MPV. If you haven't already heard through other channels, Joe Phillips, K8QOE, of Cincinnati has been declared Ohio Section Manager starting October 1 since Joe was the only nominating petition received at ARRL HQ. I wish to thank those who offered to circulate a petition for me, but I decided many months ago that it was time for me to retire and re-direct some of my time and efforts into other projects. I don't expect to disappear from the Ohio Section Amateur Radio scene, but will be busy elsewhere as well. Perhaps I'll even be able to spend more time actually operating a radio, if you can imagine that! I wish Joe well as, on October 1, he takes over the leadership of the "Premier" Section in the ARRL! Scheduled hamfests include Voice of Aladdin ARC (Columbus), August 1; Portage ARC (Randolph), August 2; Warren ARA, August 16; OHIO SECTION CONFERENCE (Columbus), August 22, 23. Bob Johnson, K3RC/8, maintains the listing of Amateur Radio exams throughout Ohio: This list is available on the packet network and in *Ohio Section Journal*. The Section Nets times and frequencies are listed below. Net and Station Activity reports for June 1998 follow:

Net	*QNI*	*QTC*	*QTR*	*Sess*	*Time*	*Freq*	*Mgr.*
BN(E)	81	50	258	31	1845	3.577	WD8KFN
BN(L)	205	97	401	31	2200	3.577	NY8V
BNR	99	36	748	29	1800	3 605	W8LDQ
OSN	119	30	431	30	1810	3 708	WB8KQJ
OSSBN	1771	563	2258	93	1030,1615,1845	3.9725	KF8DO
OH Section ARES Net					1700 Sun	3.875	WD8MPV

Tfc: N8IXF 385, W8PBX 266, KD8HB 171, WB8KFN 162, KF8DO 143, WA8HED 126, WA8EYQ 113, K8DHD 104, KR3C 104, W8RG 91, N8FWA 87, KC8JPP 85, WA8SSI 73, N8RRB 67, WB8FSV 67, N8DD 61, N8TNV 58, K8OUA 57, N2NS 55, N8YXL 51, NS8C 48, K8WRQ 46, KC8FWU 43, WB8KBW 37, N8PAI 37, W8DHF 36, KA8FCC 36, KD8K 36, KB8TIA 36, KB8UYB 36, K8JA 34, K8CW 33, N8VES 33, NY8V 32, KI8O 28, KB8GGA 25, WD8MIO 15, KE8FE 14, W8JLW 14, WB8KWD 14, WB8ZJN 14, N8GOB 13, WB8HHZ 12, K8QIP 12, N8YWX 10, KC8HTP 10, KC8IDM 8, KB8SBK 8, KA8GOV 7, W2INO 6, K8RDK 6, N8LSG 5, W8STX 5, AA8XS 4, KC8CNT 4, KB8SIA 4, KC8HFV 3, KE8FK 2, K8QOE 2, K8WC 1.

HUDSON DIVISION

EASTERN NEW YORK: SM, Rob Leiden, KR2L (@WA2UMX)—STM: Pete Cecere, N2YJZ. SEC: Ken Akasofu, KL7JCQ. ACC: Shirley Dahlgren, N2SKP. SGL: Phil Bradway, KB2HQ. PIC: Jim McKnight, WA2UMH. BM: Ed Rubin, N2JBA. OOC: Hal Post, AK2E. TC: Elmer Sharp, WA2YSM. ASM: Tom Raffaelli, WB2NHC. ASM: Bob Chamberlain, N2KBC. ASM: Andrew Schmidt, N2FTR. ASM: Richard Sandell, WK6R. Net Reports (May 1998) Check-ins (QNI)/Traffic handled (QTC+QSP): AES 24/2, CDN 368/152, ESS No rpt, HVN 530/322, NYP 253/588, NYPON 278/366, NYS/E 332/282, NYS/M 208/106, NYS/L 248/343, SDN 364/370. Section News: Congrats to Bob, KB2UZB, on his appointment as an LGL in ENY. Remember 9/12 is the Hudson Div Awards Dinner featuring the Amateur of the Year, Technical Achievement Award, and Grand Ole Ham Awards. Send awards nominations to N2GA by 7/31. 9/13 is the Convention at Bethpage, LI. See you there! Congrats to K2SMA and WX2DEB for NY and NJ declaring June as Amateur Radio Month. Happenings: Yonkers Hamfest Sun. Aug. 23 (unlimited free coffee!), Rip Van Winkle ARS has a new DX award for members, QSY's picnic is 7/19 at Putnam Cty Park in Carmel, look for the WARA nets Tues. @8 PM 28.42 MHz and Thurs. @ 8 PM on 145.495 MHz. PSHR: N2YJZ 178 (BPL, AGAIN!), N2JBA 168, N2TWN 145, WB2ZCM 141, WB2IIV 118, W2JHO 115, N1AKT 74 Tfc: N2YJZ 511, WB2IIV 90, N2JBA 80, N2TWN 74, WB2ZCM 51, KC2BTH 37, W2JHO 29, W2CJO 22, N1AKT 14.

MFJ *tunable* super DSP filter

Only MFJ gives you tunable and programmable "brick wall" DSP filters

U.S. Patent D374,010
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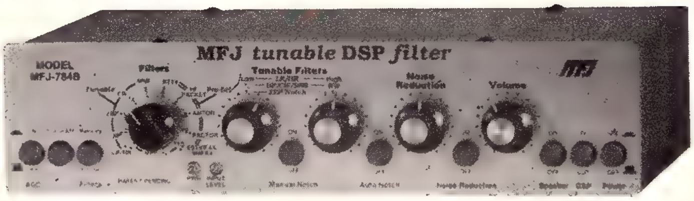


MFJ's *tunable* super DSP filter automatically eliminates heterodynes, reduces noise and interference *simultaneously* on SSB, AM, CW, packet, AMTOR, PACTOR, RTTY, SSTV, WeFAX, FAX, weak signal VHF, EME, satellite.

You get MFJ's *tunable* FIR linear phase filters that minimize ringing, prevent data errors and have "brick wall" filter response with up to 57dB attenuation 75 Hz away.

***Only* MFJ gives you 5 *tunable* DSP filters. You can *tune* each lowpass, highpass, notch, and bandpass filter including optimized SSB and CW filters. You can *vary* the bandwidth to pinpoint and eliminate interference.**

***Only* MFJ gives you 5 *factory* pre-set filters and 10 *programmable* pre-set filters that you can customize. Instantly remove QRM with a turn of a switch!**

MFJ's *automatic notch* filter searches for and eliminates *multiple* heterodynes.

You also get MFJ's advanced *adaptive noise reduction*. It silences background noise and QRN so much that SSB signals sound like FM.

The *automatic* notch and *adaptive* noise reduction can be used with *all* relevant tunable pre-set filters.

***Automatic gain control* (AGC) keeps audio level constant during signal fade.**

Tunable bandpass filters

Narrow band signals like CW and RTTY jump out of QRM when you switch in MFJ's exclusive *tunable* FIR bandpass filters.

You can tune the center frequency from 300 to 3400 Hz, and vary the bandwidth from 30 Hz to 2100 Hz -- from super-tight CW filters to wide razor-sharp Data filters.

You can use two tunable filters together. For example, tune one to mark, one to space and set bandwidth tight for a super sharp RTTY filter.

Tunable highpass/lowpass filters

You can tune the lower cutoff frequency 200 to 2200 Hz and the upper cutoff frequency 1400 to 3400 Hz. This lets you create *custom* filters for Voice, Data and other modes.

Signals just 75 Hz away literally disappear -- they are reduced 57 dB!

Automatic notch filter

MFJ's automatic notch filter searches for and eliminates multiple heterodynes in milli-seconds. It's so fast, that even *interfering* CW and RTTY signals can also be eliminated.

You can *selectively* remove unwanted tones using the two *manually tunable* notch filters --an MFJ exclusive. Knock out unwanted CW stations while you're on CW.

Adaptive Noise Reduction

Noise reduction works in all filter modes and on all random noise -- white noise, static, impulse, ignition noise, power line noise, hiss.

The LMS algorithm gives you up to 20 dB of noise reduction. Noise reduction is adjustable to prevent signal distortion.

15 *pre-set* filters -- factory set or you custom program

You can select from 15 *pre-set* filters. Use for SSB, AM, CW, packet, AMTOR, PACTOR, RTTY, SSTV, WeFAX, FAX or any mode.

If you don't like our pre-set filters, you can program your own -- *an MFJ exclusive!* Save center frequency/bandwidth, lowpass/highpass cutoffs, auto/manual notch, noise reduction -- all filter settings -- in 10 *programmable* filters.

Plus more . . .

A push-button bypasses your filter -- lets you hear the *entire* unfiltered signal.

2½ watt amplifier, volume control, input level control, speaker jack, PTT sense line, line level output. 9½x2½x6 inches.

Plugs between your transceiver or receiver and external speaker or headphones. Use 12 VDC or 110 VAC with MFJ-1315, $14.95. Cable Pack, MFJ-5184, $7.95, includes receiver cable, DC cable, 2 open-end TNC cables.

New Features

MFJ's exclusive tunable *Spotting Tone*™ -- accurately tunes even the narrowest CW filter.

MFJ's exclusive *Adaptive Tuning*™ -- tuning rate automatically becomes finer as you narrow bandwidth -- makes narrow filters easy-to-use.

MFJ's exclusive *FilterTalk*™ -- sends precise filter settings in Morse code.

Has automatic notch with *variable* aggressiveness, new quieter 2½ watt audio amplifier, new speaker switch keeps phones always active.

Manual and automatic notch can be used together. Noise reduction, automatic notch and tunable manual notch can be used when a custom filter you saved in memory is selected.

You get an accurate easy-to-use input level indicator, improved manual notch in the CW mode, adjustable line level output, more Mark-Space frequencies and baud rates for data filters and auto- matic bypass during transmit for monitoring CW sidetone, voice or data by sensing the PTT line.

Firmware Upgrade

For MFJ-784, order **MFJ-55, $29.95.** Gives you most features of the MFJ-784B.

60 dB Null *wipes out* noise and interference

NEW!
MFJ-1026
$169^95

Wipe out noise and interference *before* it gets into your receiver with a 60 dB null!

Eliminate all types of noise-- severe power line noise from arcing transformers and insulators, fluorescent lamps, light dimmers, touch controlled lamps, computers, TV birdies, lightning crashes from distant thunderstorms, electric drills, motors, industrial processes . . .

It's *more effective* than a noise blanker because interference much stronger than your desired signal can be completely removed without affecting your signal.

It works on *all modes* -- SSB, AM, CW, FM -- and frequencies from BCB to lower VHF.

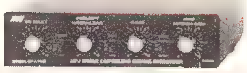
You can null out strong QRM on top of weak rare DX and then work him! You can null out a strong local ham or AM broadcast station to prevent your receiver from overloading.

Use the MFJ-1026 as an *adjustable phasing network*. You can combine two antennas to give you various directional patterns. You can null out a strong interfering signal or peak a weak signal at a push of a button.

Easy-to-use! Plugs between transmitting antenna and transceiver. To null, adjust amplitude and phase controls for minimum S-meter reading or lowest noise. To peak, push reverse button. Use built-in active antenna or an external one. MFJ's exclusive *Constant Amplitude Phase Control*™ makes nulling easy.

RF sense T/R switch automatically bypasses your transceiver when you transmit. Adjustable delay time. Uses 12 VDC or 110 VAC with MFJ-1312B, $12.95. 6½x1½x6¼ inches.

MFJ-1025, $149.95. Like MFJ-1026 less built-in active antenna, use external antenna.



Add DSP to *any* Multimode

MFJ-781
$129^95

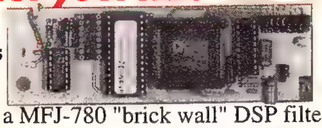
Add "brick wall" DSP filtering to *any* TNC or multi-mode data controller.

Copy signals buried in noise and QRM.

Under severe QRM, DSP greatly improves copy of Packet, AMTOR, PACTOR, GTOR, Clover, RTTY, SSTV, WeFAX, FAX, CW -- nearly any digital mode. Automatic gain control, ON/OFF/Bypass switch. Plugs between transceiver and multi-mode. Uses 10-16 VDC or 110 VAC with MFJ-1312B, $12.95. 4½x2½x5in.

DSP for *your* MFJ-1278/B

MFJ-780
$99^95



Plug a MFJ-780 "brick wall" DSP filter into your MFJ-1278/B multi-mode and you won't believe your eyes when you see solid copy from signals completely buried in QRM! MFJ-1278/B *automatically* selects the correct DSP filter for Packet, AMTOR, Pactor, RTTY, ASCII, FAX, Color SSTV, Navtex or CW.

Plug in a MFJ-780 and copy signals that other multi-modes can't. Some soldering needed.

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NEW YORK CITY/LONG ISLAND: SM, George Tranos, N2GA—ASM: KA2D, N2JIX, K2YEW, KB2SCS, KD2YA. SGL: W2UFO. SEC: WF2T. ACC: K2EJ. PIC: N2RBU. TC: WY2U. BM: KC2FD. OOC: N2JIX. STM: WA2YOW. Mark your calendars for the Hudson Division Convention in Bethpage on Sept. 13. There will be forums all day and a Club Presidents Meeting at 2 PM. The Awards Dinner is Sept 12, starting 7 PM at Maine Maid Inn in Jericho. The 50th Anniversary of JFK Airport special event has been changed to 8/22. Congratulations to new club officers: for Peconic ARC president: Roberta, N2RBU; vp: Robert W2IPX; secretary: Warren, KG2BI; treasurer: Margaret, KC2CYC; for LIDXA president: Martin NN2C; vp: Pat KE2LJ, secretary: Ed K2MFY; treasurer: Russ AA2LC; NYC/LI VE exam list follows: Islip ARES, 1st Sat 9 AM, Islip Town Hall West 401 Main St. Islip, Addison Levi, KD2YA, 516-234-0589. Bears VE: ABC Bldg Cafeteria, 125 West End Ave at 66th St. Call Hotline 212-456-5224 for exact dates & times, Jerry Cudmore, K2JRC. Grumman ARC (W5YI) 2nd Tues 5 PM. Northrop-Grumman Plant 5 S Oyster Bay Rd via, Hazel St Bethpage, NY. Bob Wexelbaum, W2ILP, 516-499-2214, LIMARC, 2nd Sat 9 AM NY Inst of Tech, 400 Bldg Rm 409, Northern Blvd. Old Westbury, Al Bender, W2QZ, 516-623-6449. GALLUPS Island RA. 3rd Sat 1 PM, USMMA, Bowditch Hall, Steamboat Rd. Kings Point, NY. Les Rauber, AA2E, 516-922-0947. Great South Bay ARC, 4th Sun 12 PM, Babylon Town Hall, ARES/RACES Rm 200 E Sunrise Hwy N Lindenhurst, Tom Carrubba, KA2DFO, 516-422-9684 Hellenic ARA: 4th Tues 6:30 PM; Pontion Society, 31-25 23 Ave, Astoria, NY, George Anastasiadis, KF2PG, 516-937-0775. Larkfield ARC: 3rd Sat 9 AM, Huntington Town Hall, 100 Main St, Huntington, NY, Joe Coffield, W2DDZ, 516-266-3192, Columbia U VE Team: 3rd Mon 6:30 PM, Watson Lab 6th floor 612 W 115th St NY, Alan Crosswell, N2YGK, 212-854-3754 PARC: exams held every three months at Southold School Oaklawn Ave, Southold, NY, on next to last Friday of the month.6:30 PM all classes of licenses. For info contact Ralph Williams, N3VT, 516-323-3646. Report all changes to N2GA before the 12th of the month. Tfc: N2AKZ 130, KC2ACL 108, WB2GTG 105, KB2KLH 85, W2RJL 77, N2XOJ 72, N2WGF 65, KB2GEK 38, KB2ZHF 36, WA2YOW 31, KG2LL 7.

MIDWEST DIVISION

IOWA: SM, Jim Lasley, N0JL @ KE0BX—ASM: N0LDD. SEC: NA0R. ACC: N0IJP @ KE0BX. BM: K0IIR @ W0CXX. SGL: K0KD. TC: W0DIA. I regret the need to report to you the passing of former Iowa Section Manager Jack Duncan, K0CNM. I understand Jack died of a heart attack following a long bout with diabetes and a stroke. He served well for many years. Remember K0CNM. I also regret to note that W0TXO is SK also. Two too many. TriCounty Hamfest is Aug 30 in Ottumwa. Amana is Aug 9. Mt Pleasant has a new banner letting everyone know who they are. KA0FBL and XYL have some intermodulation distortion (I never felt that harmonic was technically correct!) so congratulations! There are notices in the CVARC letter about intruders in our bands. Please do not encourage that kind of action. Inactivity encourages it! Get on the air often. New officers of NIARC are KB0JBF, N0LXS, and W0QZP. They note that they not only gained a good leader in the new pres, but a great hamburger BBQ cook! How do you beat a deal like that? Boone Amateur Radio Club (BARC) also has new officers: N0QOB, KB0HYY, and N0YKX. IIARC is trying to work with CAP in Burlington. They want to share site, antennas, aid in emergencies, etc. Nice idea. They also did an activity at Y-Camp McBride. PR. Had a great time at Sioux City and over 850 showed up. N0LDD slept for two days. Never got to the Hamfest! Nice to see K1ZZ again. FD is now over and I wandered again. I visit the sites I am invited to visit. Did I miss yours? I would like to be invited to enough that I miss some, because I didn't have the time. 73 Newsletters were received from FMARC, MPARC, CVARC, NIARC, BARC, IIARC, CAARC, SARA, DMRAA, CIRAS. Tfc: W0SS 155, N0JL 30.

KANSAS: SM, Orlan Q. Cook, W0OYH—ASM/ACC/OCC: Robert Summers, K0BXF. SEC: Joseph Plankinton, WD0DMV. SGL Marshall Reese, AA0GL. Hi gang, I got a nice surprise in the mail. It was the K0S QSO Party certificate. The Sandhills ARC operated from the highest point in Kansas. THANKS! George, N0LIE, and his new guide dog, Rayna, just graduated from the Blind Academy near Boring, OR. Good to have him back on the air. The nominations for Kansas Amateur of the Year are in, and a selection is being made. Tnx to Ken, KC0GL; Diane, KB0RSK; Ron, KB0DTI; club K0PRO; Jim, AC0E; Bruce, K0BJ; and anyone I missed, for your club newsletters. Follows is a list of our Kansas nets: Ks WX nets meet daily on 3920 at 7 AM and 6 PM, KS Phone net on 3920 at 8 AM S&S, Central States Tfc net 12:30 M-S on 7253 and 8:30 AM Sn, KS Sideband net 6:30 PM dy on 3920, KS CW net QKS on 3610 dy at 7 & 10 PM, Slow speed CW net on 3710 Wed @ 7:30 PM. Reports for Apr: Nets: sessions/QNI/QTC, KSBN 31/1005/111 KPN 21/265/ 10,KMWN 31/618/507,KWN 31/816/512,CSTN 26/1853/91, QKS 58/ 302/66, QKS-SS 4/9/2. SEC report:QNI/271 QTC/2 with KB0WEQ, WD0DDG KB0YQV N0LJR WD0DMV. TEN report 280 msgs 62 sessions Ks stns 73% with AC0E, AA0FO, KX0I, K0PY, NB0Z, WB0ZEN, WB0ZNY. DTRN KS participation 96% with N0KJ, AA0OM, W0OYH, KF0LB. Packet BBS reports W1AW Bulletins/Personal/NTS, AA0HJ 52/446/2, N0OBM 29/272/0, NX0R 26/342/2. Tfc: N0KJ 232, W0OYH 89, WB0ZNY 88, K0PY 39 KX0I 23 NB0Z 20, KB0DTI 15.

MISSOURI: SM, Roger Volk, K0GOB—ACC: Keith, WE0G. ASM: Karen, N0TDW. ASM: Tom, KI0JO. OOC: Mike, N0QBF. PIC: Dennis AA0A. SGL: Ern, KD0UD. BM Open. SEC: Fred, WA0US. STM: Tom, KI0JO. TC: Mac, K4CHS. Joe, W0OTF, the NM of the MON will be moving out of the Section after graduation this summer. When you check in during the next few weeks, take time to thank him for a job well done. Stepping up to the NM's job will be Dave W0WFF. Thanks to both for volunteering their time. The first annual MOTRAN picnic was held in Columbia and many eyeball contacts were made. Thanks to Sherm, WB4RDV, for organizing the event. The WX for Dayton was fantastic this year. See other articles for details. It was good to see many Section members at the joint Midwest and Dakota Div convention in Sioux City, NE. Good forums, good friends, good food, good bargains, and a tornado touchdown made the event worth the long drive. I've written almost 100 of these

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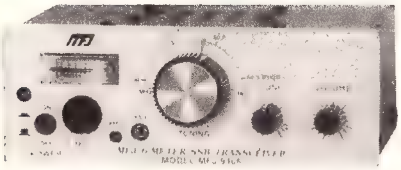

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Easy to operate: No microprocessor mumbo-jumbo . . . just turn on and tune in.

Low power drain: Mountain-top all day on lightweight NiCads or operate from home on 110 VAC with MFJ-4110, $39.95.

Excellent selectivity: Sharp *HF proven* SSB crystal ladder filter reduces QRM and passband noise.

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MFJ 6 Meter J-pole Travel Antenna

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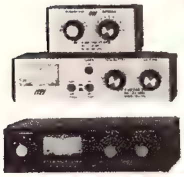

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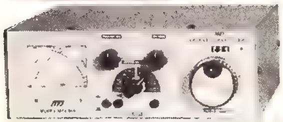

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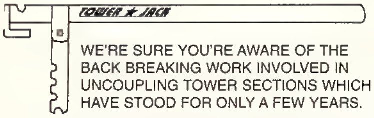

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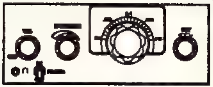

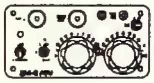

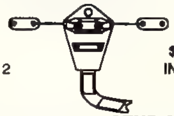

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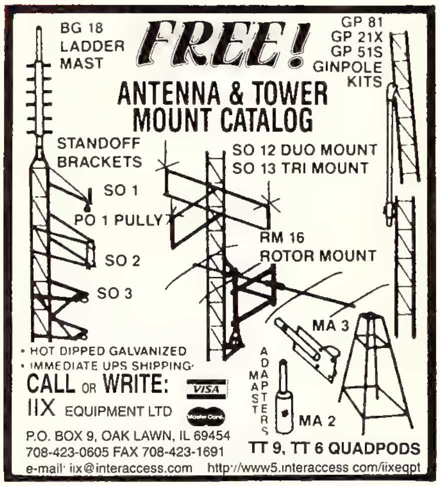

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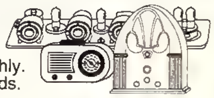

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columns but this one is definitely the most difficult. As you know, I retired two years ago, after working 28 years for the same large corporation. I had a very competent staff and I could take off as needed to attend club meetings and hamfests around the state on any given day of the week. Now as a consultant, my clients determine when I am needed at their offices around the country and I cannot plan in advance, nor attend activities during the week. The Section deserves a full-time SM and I can no longer provide that function. As a result, I will not seek re-election to the SM job when my term expires at the end of this year. There are a number of good candidates in the section; convince them to run. Nets: 31/495/94 K0IPM, STLRPTR 4/124/8 K0WEX, PAULREVERE 5/491/0 N0IWA, HAMBUTCHERS 21/735/36 WL7YM, MON1&2 62/217/70 W0OTF, WAARCI 4/76/0 KB8DQB, WJACKCOARES 5/39/0 K0UAA, 1880GOB 31/273/32 WL7YM, CARL 3/29/0 KC0MV. AUDRAINARC 4/38/1 WB0SEN, HARC 4/208/0 N0YLF, QCWA35 4/92/0 K0YML, SPARK 4/45/0 W0ENW, ROLLABB 28/341/13 NA0V, KCABARC 4/174/4 KA0SSE, SWMOWARN 20/350/15 KG0IV. Tfc: KI0JO 654, W9OTF 89, KG0IV 62, KE0K 12.

NEBRASKA: SM, Bill McCollum, KE0XQ—ASMs: W0KVM, N0MT, WB0ULH, WY0F & WB0YWO. It is with deep regret to inform you of the following Silent Keys: W0ATF, WD0BVH, K0OPC and WA0JZW. It was great to see many of you at the Dakota/Midwest Division Convention on May 30. Congratulations to the 3900 Club and the Sooland ARA for doing a great job! K1ZZ gave us a report on what is happening at ARRL HQ and with Amateur Radio. May was a busy month for ARES organizations across the state. LARES and MARES organizations put in some long nights the last weekend of the month. W0AP, NM for the NE CW Net, advises me that the net is suspended until after Labor Day. Don't forget the AK-SAR-BEN ARC Flea Market to be held at the Millard Social Hall on August 23. For more information, contact Dave, WJ0Z, 402-592-4930. Members of Cub Scout pack 72 spent the evening of May 12 in the shack of KA4ZZQ. They were informed about some of the aspects of Amateur Radio, different modes, capabilities, and given a live demonstration of ATV. The Elkhorn Valley ARC has been officially renewed as a Special Service Club. The club is to be commended for its hard work. Traffic: K0PTK 115, W0AP 40, KE0XQ 30, WY0F 4, W0EXK 2, K0OAL 2, AA0KQ 2, WC0O 2, KB0ZOM 2, KA0DBK 2, KB0YTM 2, PSHR: KA0DBK 112, KB0YTM 19.

NEW ENGLAND DIVISION

CONNECTICUT: SM, Betsey Doane, K1EIC—It is with sincere regret that I report the resignation of Affiliated Club Coordinator Neil Salowitz, WA1CBW. Neil's work and family commitments will prevent him from continuing in this position. However, happily, he will be keeping up the CT Web site http://ourworld.compuserve.com/homepages/nsalowitz/hamradio.htm so do not forget to give him lots of news about your club to put on that site. Many of you will remember Neil's hard work coordinating the amateur station at Special Olympics! A big thank you to Neil—I've enjoyed working with him very much. At this writing, I am in the process of recruiting a new ACC for CT. The Hartford Marathon needs your help! This is a very large event October 10. N1QKP is this year's contact person; he is looking for clubs or individuals to participate in the large communications effort. For more information, check out the Web site: http://www.cookiearrangements.com/amateurradio/, e-mail n1qkp@cookiearrangements.com or telephone 860-741-7248. For those of you interested in the latest information about repeaters in CT, subscribe to the CT repeaters reflector by sending a message to majordomo@qth.net and in the body of your message write Subscribe ctrepeaters. You will be automatically added to the list and receive e-mail from other list participants. Traffic handlers should mark their calendars for the annual picnic July 26 at the home of K1EIC. Please let me know if you are coming so I can provide you with the details. Here's a great opportunity to bring in new hams! Dan, K3UFG, a member of the Educational Activities Staff at Headquarters, will be holding a weekend Technician Class Friday, July 31-Sunday, August 2 at ARRL Headquarters. During that weekend, the Novice and Technician theory will be covered. On the weekend of August 8 and 9, participants will be given instruction and practice with CW. Dan is looking for volunteer examiners to help with examinations on Sunday, August 2 and Sunday, August 9 in the afternoon. The $50 registration fee for participants covers the cost of workbooks, exams, course books, tapes, lunches, other instructional materials. Phone: 860-289-3379 or e-mail k3ufg@ntplx.net or at dmiller@arrl.org. Net sess/QNI/QTC: WESCON 31/427/98; nvtn 31/214/66; RTN E/L 31/31, 148/233, 10/35; CPN 31/242/71; CN 22/90/41; BEARS of Manchester 20/190/250. Tfc: NM1K 2395, KA1GWE 159, K1STM 116, WA4QXT 108, N1VXP 83, KE1AI 64, N1YVV 26.

EASTERN MASSACHUSETTS: SM, Larry Ober, W1MW—ASMs: WA1IDA, KB1BCF, N1GTB, N1UGA, N1SGL. ACC: Open. BM: N1IST. OOC: K1LJN. PIC: N1PBA. SEC: W3EVE: K3HI. STM: WA1TBY. TC: W3EVE. Webmaster: N1GTB. EMA ARRL: voice: 978-263-2498. Packet bulletins: ARRL@EMABBS. E-mail: w1mw@arrl.org. e-mail list:ema-arrl@netcom.com. Web: ttp://www.qsl.net/ema-arrl. It seems that everyone is getting ready for Field Day. The Quannapowitt ARA will be setting up at the MIT Bates LinearAccelerator in Middleton. The Falmouth ARA will be at the Otis military reservation. Boston ARC will once again be at the top of Larz Anderson Park in Brookline. Genesis ARS will be at Pine Hills off Rte 3A. Wellesley ARS will be back at Babson College. Waltham ARA will be at Prospect Hill Park off Totten Pond Hill Rd. That's all I have as a number of newsletters mentioned Field Day but not the location. The Southeastern Massachusetts ARA is putting together a Club History Book covering the club's 65 year history starting in 1932. The Nashoba Valley ARC has a slow speed CW net Tuesdays and Thursdays (except on the monthly meeting night) on 28.123. The Waltham ARA will celebrate 60 years on Field Day. The Cape Ann ARA held their Spring Dinner in Gloucester. The Algonquin ARC has a new club room at the old Central Fire Station. The Quannapowitt ARA will be holding their annual banquet on June 19th in Reading. ASM Elaine, N1GTB, has accepted the position of Webmaster. The EMA Web page is now being upgraded and brought up to date. Please contact

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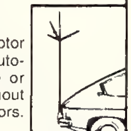
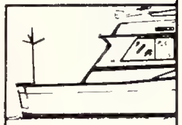

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Elaine with any suggestions or corrections for the Web page. We are still looking for an Affiliated Club Coordinator for the EMA Section. This position has been vacant for some time. It is an excellent opportunity for a person active in club work to participate in a larger arena. Please drop me a message or call if you would be interested in learning more about this opportunity. 73 de W1MW. Tfc: WA1TBY 581, W2EAG 111, NZ1D 110, WA1FNM 105, N1LKJ 88, KA1WCD 78, K1SEC 77, K1BZD 70, WA1LPM 69, N1AJJ 49, N1SGL 45, N1LAH 28, N1IST 25, K8SH 24, NG1A 23, KB1EB 19, KA1BBU 16, N1VUX 12, N1TDF 10, N1TPU 8, N1XQC 4.

MAINE: SM, Bill Woodhead, N1KAT—ASMs: WA1YNZ, KA1TKS. STM: NX1A. BM: W1JTH. TC: NS1Z. SGL: W1AO. ACC: KA1RFD. OOC: KA1WRC. PIC: KD1OW. SEC: N1KGS. Asst Dirs: W1KX, KA1TKS, K1NIT. The state is full of radio activity. The PWA found plenty to do with the Tour de Cure. Tnx to NX1A, KA4ATI, KB1CHS, KB1CPB, K1FXR, K1GAX, N1GRO, N1HTT, W1IF, N1IZX, N1JSR, N1PEO, AI1Q, N1QWF, KC1UX, KA1VQQ, W9WBA, N1YRI, WA1YZV, W1ZW. The Great Falls Canoe Race was kept afloat with Andy Club members WA1SCQ, N1QHW, N1WFO, N1YWP, N1ZRL. The Hermon HS was a great place to hold a Hamfest. Bright and cheery inside and easy to get around outside. It was nice to see the hamfest season off to a great start. Looking forward to seeing all who can make it to the Union Hamfest and the PWA in Saco. ARES is undergoing a slight facelift with W9WBA as state training coordinator and N1HWN as Central ME DEC. Tfc: NX1A 165, W1JX 53, N1HYF 31, N1JBD 19, AF1L 71, W1LIC 14, W1KX 108, W1QU 28, KA2ZKM 16, W1JTH 29, W1CE 10.

NEW HAMPSHIRE: SM, Al Shuman, N1FIK—ASMs: W1NH, N3CLZ, N1FIL, N1KIM. TC: WA1HOG. STM: WA1JVV. ACC: NA1E. PIC: KA1GOZ. OOC: W1GTA. SGL: K1KM. BM: KH6GR. SEC: open. (www.nharrl.org). In June, Rich Force, WB1ASL, resigned ASM for the North Country and as the SEC for NH. Citing ever-growing personal commitments, Rich was a valued member of the NH Field Organization. I thank him for his generous years of devoted service. No replacement has been named for either post at this time. Amoskeag RC has entered into discussions with the Manchester Historical Society in an effort to gain the use of the SMYTH Observatory as reported by Harv, W1ZIZ, who was a member of the old Manchester Radio Club (W1LVK) when that club used the facility in the 1950s. Matthew Dydo invites young hams to join in on the Young People's Net held every Thursday 7-8 PM on the IRS 146.850 MHz repeater. It is a fine opportunity for young hams to participate in net operations and offers a chance to introduce young folks and nonhams to the hobby. Thanks to Dan, NA1E, who agreed to take the northern route on Saturday's Field Day romp. 73, Al, N1FIK. Net/mgr/sess/QNI/QTC/time: GSFM/N1RCQ/31/261/79/531; GSPN/K1ZO/35/119/16/183; TSEN/N1VFM/4/73/3; VTNH/WA1JVV/31/158/155/494. Tfc: W1FYR 2249, W1PEX 926, K1TQY 281, WA1JVV 217, WB1GXM 156, N1CPX 155, N1NH 60, W1ALE 60, KA1OTN 50, AA1QD 26, K1ZO 25, AE1T 4.

RHODE ISLAND: SM, Rick Fairweather, K1KYI, e-mail k1kyi@juno.com—ASM: N1JFY. ACC: AA1CE. SEC: N1JMA. OOC: W1AOM. TC: KA1EGY. BM: KA1BNO. SGL: NN1K. Coordinated by KD1MH, the Blackstone Valley ARC provided comms for the annual Diabetes Assn's bike rides in Narragansett in May. Operators from BVARC provided the sweep vans with radios and operators and net control at the high school. Washington County ARA allowed the group the use of their 2-meter repeater, which covers the area well...in some cases better than the cell phones. In all, eight members took part and there was only one minor injury to the riders. K1DFT placed first in RI in the 160-Meter Contest recently...congratulations. The CTRI Contest Group will sponsor the Rhode Island QSO Party from 0000Z October 10 to 2400Z October 11. Details can be found at the club's Web site at http://www.99main.com/~ctri or e-mail KB1LN at brogers@ebmail.dgeb.com. There will be award certificates for the 3 highest scoring stations in RI as well as individual states, provinces, countries, and the highest QRP score. Tfc: KA1JXH 68, K1KYI 4. PSHR: KA1JXH 122.

VERMONT: SM, Bernie Capron, N1NDN—On May 24, the Vermont All City Marathon took place in Burlington. The directed net was run by Carl Phillips and Mark Allard. Many hams were present at the rest stations and other sites along the route. Congratulations on a fantastic job! The net was handled very professionally. On May 29 and 31 SKYWARN was activated and hams participated in watching for funnel clouds in southern Vermont. Training for ARES should be under way by now. As of this writing we plan the first class to be held in Randolph on June 20. Please make sure that you attend these meetings if possible. One of the biggest complaints I hear is that no one knows what to do in the event of an emergency. This is your chance to receive official training and get involved. Please contact Joe Armstrong, KA1YLN, or me for more info. Sessions/Checkins/Traffic: Vermont/New Hampshire Net (VTNH) 31/158/155; Vermont Phone Emergency Net (VPEN) 5/39/1. Green Mountain Net 26/634/21. Tri-State FM Emergency Net (Keene) 4/73/3. Windom County ARES Net 1/7/0. PSHR: KT1Q 148, N1DHT 99, Tfc: KT1Q 342; N1DHT 179, KA1YLN 7. Vermont had 85% representation on 1RN Cycle 2.

WESTERN MASSACHUSETTS: SM, William C. Voedisch, W1UD, w1ud@juno.com—ASM: N1LZC. ASM (digital): KD1SM. STM: W1SJV. SEC: K1VSG. OOC: WT1W. Pat, N1LZH, had a great description of his adventure going and returning to Dayton. Great time for the air conditioner to break down. One of these days, I will retire for the second time. Then, I'll make a trip to Dayton. By the time you read this, FD will be over. I hope that it was all everyone expected. Above all, I hope that there were no accidents. If you are a member of a club and didn't go out to the site, you should be ashamed. The FD committee of your club devoted many hours organizing the event. Even if you didn't operate, you should have given the participants moral support by going to the site. Another thing that I observed: If you're going to operate CW and use a computer for logging, set the CW speed to the speed that you can receive. I've never had so many stations ask for repeats. Maybe it's the sign of the times. Send fast and receive nothing. Try a little code practice on W1AW. During the summer, our area is

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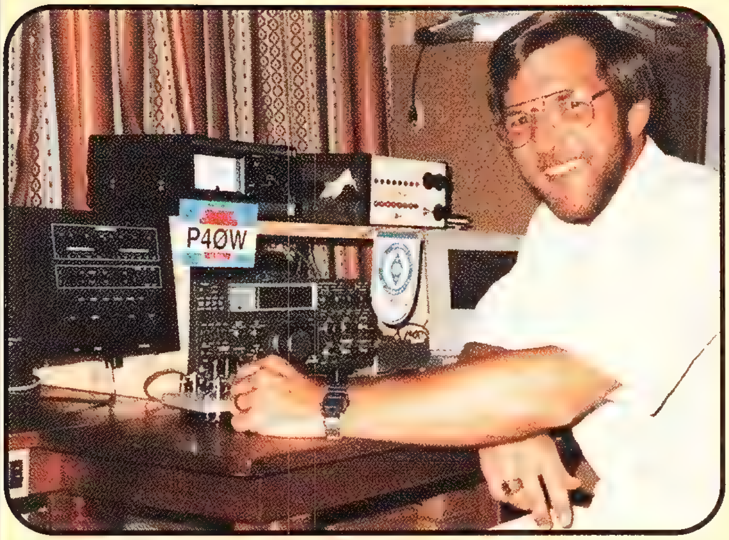

*John Crovelli, P40W/W2GD is a regular among world top scorers. He and his **ALPHA 87A S/N 001** won CQWWDXCW in '96 and took #3 SSB in '97*

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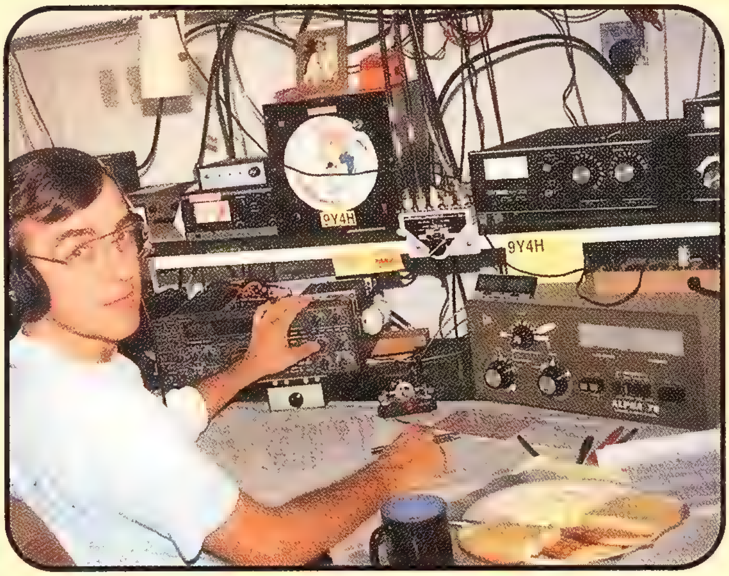

*Glenn Rattmann, K6NA (above) has owned **ALPHAs** for 25 years. In 1996 he took 9Y4H to the **world #4 SSB** with this classic **ALPHA 78**, and José, CT1BOH, took it to the **world #3 CW**.*

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NORTHWESTERN DIVISION

ALASKA: SM, David Stevens, KL7EB—OOC: KL7IKX. Snipers Net 3.920 daily 1900 AST; Bush Net 7.087 daily 2000 AST; Motley Net daily 3.933 AST; Alaska Pacific Net 14.292 M-F 0830. We all had fun at Field Day even though the good propagation didn't come until midnight. The Anchorage Amateur Radio Club and South Central Radio Club meet at Tudor Dog Track. The Motley Group picnic at Byers Lake, mile 147 gave many eyeball QSOs and much fun. The Yukon 800 Boat Race in July proved the usefulness of ham radio. We thank all the members of the Arctic Amateur Radio Club for their support. Be sure to clean out your garages for the Anchorage Hamfest Sept 19-20, 1998, and the Fairbanks Hamfest Sept 26, 1998. QCWA's Jimmie Tvrdy, KL7CDG, is looking for hams in Alaska licensed 25 years or more. Please call him ASAP at 1-907-345-3063.

EASTERN WASHINGTON: SM, Kyle Pugh, KA7CSP—SEC: WA5ZAY. STM: W7GB. OOC: KB7HDX. SGL: WB7UEU. TC: N7TOF. I want to thank those of you who took the time to write and send comments to the FCC regarding the proposed takeover of our 420-450 MHz band by the LMCC. This is at least the third time commercial interests have gone after our VHF frequencies, first the 220 band, then the 2-meter band last year and now this. It is very important for section leadership appointees to document public service hours and to get your monthly reports in on time. Also League membership and support is important. More participation on the WSEN is needed (3.987 on Monday @5:45 PM and Saturday @ 9 AM). In this section over 75% of you (DECs and ECs) are licensed to access this HF net. The Spokane Original Hamfest is August 1 & 2 at University HS in the valley. Tfc: W7GB 313, K7GXZ 264, K7BFL 181, KA7EKL 67, KK7T 59, W7UVP 10. PSHR: W7GB 139, K7GXZ 145, W7UVP 74. Net activity for May: WSN: QNI 823, Tfc 349; Noontime Net: QNI 7409, Tfc 204; WARTS: QNI 2777, Tfc 174.

IDAHO: SM, Mike Langrell, AA7VR—OOC: N7HGV. SEC: KI7EP. STM: W7GHT. Just got back from the SEAPAC conference. I was able to get a hold of the Oregon State Amateur Radio communications plan. This should serve as a good model for the Idaho plan to be developed from. I hope to get that written soon so it can get through the process of being officially adopted by the state of Idaho. Congratulations to Rich Dees, AA7WG, for becoming the Northwestern Division Volunteer Ham of the Year. Mary Lou Brown presented Rich with a handsome plaque at the June Voice of Idaho Amateur Radio Club meeting. He has worked on club projects, educational activities, and supported community events. Rich has been an outstanding ham for as long as I can remember, and is very deserving of this award. 73, Mike, AA7VR. Tfc: W7GHT 190, WB7VYH 156, KB7GZU 40, and N7MPS 18. PSHR: W7GHT 120, WB7VYH 113, N7MPS 70. Net SESS/QNI/QTC/Mgr: FARM 31/2024/29 N7OGR; NWTN 31/1585/86/KC7RNT; IDACD 21/488/18/K7UBC; IMN 31/370/253/WB7VYH.

MONTANA: SM, Darrell Thomas, N7KOR—The Hellgate Amateur Radio Club of Missoula provided escort and communications for the Annual Tour of the Swan Valley. This large bicycle tour consisted of 600 bicycles and covered a 200 mile course. This has been an annual event for the club and one which has brought them much praise and good public relations. As reported earlier the Yellowstone Radio Club of Billings has challenged their members to promote a high percentage of upgrades within the organization. To date they are showing a good success in the effort. Since January 1 of this year, they have recorded 4 new Technicians, 8 new Technician Plus', 2 new Generals, 4 new Advanced and 2 new Amateur Extra operators. Congratulations to the new hams, to those who have upgraded and to the Yellowstone Radio Club for their efforts in promoting this effort. The Great Falls Area Amateur Radio Club and the Yellowstone Radio Club are both currently in negotiations with their respective city and county governments over tower restrictions. Net/QNI/QTC/NM MSN 155/1 W7OW; MTN 1520/47 N7AIK; IMN 370/253 WB7VYH. PSHR: N7AIK 123.

OREGON: SM, Randy Stimson, KZ7T—ASM: W7FBP. ASM: KF7KE. ASM: KG7OK. ASM: N7QQU. STM: W7VSE. SEC: WB7NML. PIO: KC7YN. SGL: KA7KSK. ACC: AA7OA. STC: N7HMV. OOC: NB7J. I decided that it was time for a change, so I didn't run for section manager. This will be my last section report. As most of you already know, Bill, K7ZM, is the new section manager. I know Bill, and he will do a great job. But on with the report. The SEA-PAC Convention was a great success as usual. The main reason is that there are so many people willing to spend their time helping. The Oregon Tualatin Valley ARC (OTVARC) is the main sponsoring club but Hoodview ARC, Tektronix Employee Radio Amateur Club, Clark County ARC, in Vancouver, Washington, and the Sunset Empire ARC, in Astoria, all contributed to its success. It still amazes me how many hams will spend so much time helping. I would like to thank all of the hams, appointees and others that have helped me over the years. There are too many to try and list them all. There are two that have been special. One is Vic Seeberger, W7VSE. Vic has been reporting the NTS Traffic for more than 18 years. Then there is Lew Williams, WB7NML, the section emergency coordinator. Lew has been the best SEC I ever had. He has set up great programs as well as finding new ECs. The state was so impressed with him that they made him state RACES officer. He would let me know that an EC had quit, but he always had a replacement. How he did it, I will never know. Tfc: N7DRP 407, WA7EES 156, K6AGD 144, W7VSE 114, W7WAT 86, KA7AID 54, K7NLM 38, and N7OKM 15. I am looking forward to visiting with you as I travel around the state. Thank you again. 73, KZ7T.

WESTERN WASHINGTON: SM, Harry Lewis, W7JWJ—Want to receive the latest info and bulletins regarding ARES in Western Washington? Send an e-mail to: areswwalist@eskimo.com. Under the subject and body type Subscribe. This service is offered by Public Information Coor-

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Installation and dismantling of towers is dangerous and temporary steel guys of sufficient strength and size should be used at all times when individuals are climbing towers during all types of installations or dismantlings. Temporary steel guys should be used on the first 10' of a tower during erection or dismantling. Dismantling can even be more dangerous since the condition of the tower, guys, anchors and/or roof in many cases is unkown.

The dismantling of some towers should be done with the use of a crane in order to minimize the possibility of member, guy, anchor or base failures. Used towers are not as inexpensive as you may think if you are injured or killed.

Get professional, experienced help and read your Rohn catalog or other tower manufacturers' catalogs before erecting or dismantling any tower. A consultation with your local professional tower erector would be very inexpensive insurance.

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dinator Bruce, KC7IAY. A good receiver, a good antenna system and a little time to serve your fellow radio amateurs, that's all it takes become an official observer. Send your qualifications to OOC Renee Eck, AA7KE, care of n6dcd@whidbey.net. Clallam Co. EC, Bob Sterns, KI7ZC, reports that his group has completed a 3 position installation in the County EOC that includes a full time packet station using the call sign KC7MOF-1. Randy Greeley's (NU7D) team in Cowlitz and Wahkiakum Co have just participated in two exercises and found they had some areas that needed improvement. They are also on standby to support disaster response agencies in Kelso where over 50 homes may be affected by a hill that is sliding due to heavy rainfalls. King County ARES participated in an exercise on June 20 to test simplex coverage throughout the county. EC Ken Weber, K7CLL, is back in the saddle after by-pass surgery. Under team leader KG7CX the Clark Co ARES participated in the Annual Safety Open House sponsored by Fire Dist 3. Using VHF, UHF and HF radios for public inspection this group also handled 40 some pieces of written traffic for the City of Vancouver and other agencies during an exercise involving a simulated terrorist attack. DEC Monte, KB7RID, reports that several Kitsap Co ARES/ACS volunteers, with support from the Kitsap Co Communications Van provided communications during a three day soccer event held in north Kitsap Co. Monte is looking for a Central Kitsap EC, training coordinator and SAR liaison. The Shoreline ACS team has received the club call sign KD7BWR for use at any of the three fire stations in that area. Kitsap Co has a new repeater that is dedicated to emergency communications. Matt Amis, K7OE, ACS program manager, is the trustee for the repeater. It operates on 145.43 MHz - 600 kHz offset and is located just West of Silverdale. I've observed, as an NCS, a gradual decline in 75-meter traffic net activity. This may be also due to the decline in upgrading, once considered the thing to do, in amateur licensing. Upgrade! It's part of the amateur tradition. Traffic reports next month. 73.

PACIFIC DIVISION

EAST BAY: SM, Bob Vallio, W6RGG—ASMs: W6ZF, KF6RCO. SEC: N4OGL. DECs: WA6TGF/Alameda County, KO6JR/Contra Costa County, WA7IND/Napa County, K6USW/Solano County, N6UOW/Training, KE6HCI/Administration, KE6NVU/Finance, W6CPO/Technical Services. STM: K6APW. OOC: W6NKF. TS: KF6NY. The Alameda County Emgy Svcs (ACES) Net is held Tuesdays at 8 PM on 147.240, 444.200 (107.2), 147.120, 224.740, 441.125 (100.0) & 145.43 (100.0). All are linked for the net, and those interested in Emgy Comms are invited to check in. Check out the EB WWW Page at http://www.pdarrl.org/ebsec/. Webmaster is KB6MP. EBARC will celebrate their 50th anniversary by operating W6CUS as a Special Event Station, 1900Z August 29 to 0700Z August 30. They will be on 146.520, 446.000, 144.237 & 432.075, plus SSB on 3.870, 7.237, 14.237, 21.370 & 28.370, and CW on 3.700, 7.135, 14.120, 21.175 & 28.250. Operations on 30, 17 & 12 meters are also possible. The club welcomes new member Brenda Roberts. Oakland ARES/RACES now meets at the FD Training Center, 250 Fallon St, Oakland. Members KQ6JZ, KB6MP, KE6SSY, KE6SSX, WA6CUY, KE6STB, KF6CDY, KF6JRL, K6TQS & W6LL provided comms for the M/S Walkathon. The group welcomes new members KA6FFS & N6ZWI. VVRC members providing comms for the March of Dimes Walkathon were N6WVF, NI6V, KA6FDI, N6ZGB, KD6FZY, WB6FIS, K6MW, W6ROY & KC6WYC. May tfc: W6DOB/574, WB6UZX/48. PSHR: W6DOB. BPL: W6DOB. Tfc nets: NCN1/3630/7 PM; NCN2-SLOW SESSION/3705/9 PM; NCN-VHF/145.21/7:30PM; RN6/3655/7:45 PM & 9:30 PM; PAN/3651/7052/8:30 PM.

NEVADA: SM, Bob Davis, K7IY—SEC: N7JEH. TC: NW7O. ACC: N7FFP. STM/SGL: N7CPP. PIC: WW7E. OOC: N7ELV. Greetings to all section members. Traditionally, during midsummer, the Amateur Radio VE testing program slows down quite a bit, but reports from across the section indicate a continuing strong growth in entry level licensing. I hope all VE teams will take advantage of this by placing current ARRL membership applications along with local club info at the test sites. The SNARS race communications team is doing well with this year's busy race schedule, says Neil, WA7KCD. George, AA7JZ, reports success and a good turn out to help with the ARES/RACES "Power Out Exercise." Lynn, AB7LW, reports that the SIERA club was treated to an in-depth look at the Nevada Department of Transportation radio system, as presented by Richard, KA7SSG. The UNR Radio Pack has been very active assisting with many public service and community events in the last few months, says Gary, K7VY. I am already receiving many advance schedules for upcoming Technician license classes that will be starting in the next few months all over the section. Work is still in progress between Joe, N7JEH, our SEC, and our neighbors in California near Mammoth Lakes, to set up a joint response in the event of an eruption. Thanks and 73! Bob, K7IY. Tfc: N7CPP 13.

PACIFIC: SM, Ronald Phillips, AH6HN—SEC: Dennis Carvalho, KH7H—ASM: Harry Nishiyama, KH6FKG. ASM: Lee Wical, KH6BZF. SGL: Ron Phillips, AH6HN. PIO: Russ Roberts, KH6JRM. Please welcome aboard ASM Jim Reid, KH7M, for Kauai. ASM George Heloca, Sr, for West Hawaii; and TC Chuck Cartwright, AH7Y. Please continue letting me know how timely *QST* is delivered for the section. So far, it has improved for Hawaii. The Great Kohala Picnic and "show and tell" took place May 16 at Mahukona Beach Park, 12 miles north of Kawaihae. Arranged by the Hawaii QRP Club, it was attended by KH6AFQ, NH6XB, KH7T, WH6AVF, KH6BMM, NH6WW, NH6WX and KH6B. Please consider participating in local nets:

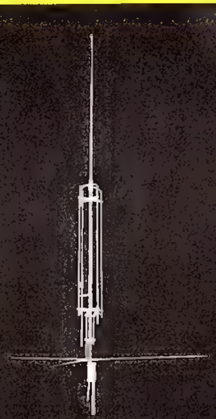
Hawaii Afternoon Net	0200 UT	7.088 MHz
Pacific Interisland Net	0800 UT	14.315 MHz
Friendly Net 1900 UT	7.285 MHz	
EARC Net – Mon	1930 HST	146.88 MHz
EARC Net – Fri	1930 HST	146.80 MHz
Hawaii ARES - 1st Thu	0500 UT	3.905 MHz
HI QCWA - 1st Mon	0100 UT	7.088 MHz

Mahalo, 73 and Aloha.

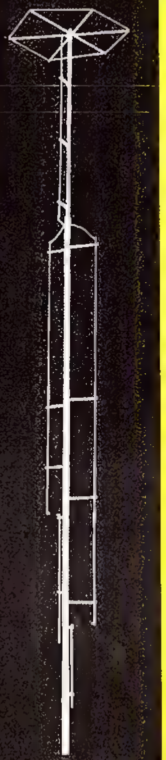
SACRAMENTO VALLEY: SM, Jettie Hill, W6RFF—SEC: K6BZ. BM: W6KJ. TC: WB6RBE. STM: WA6WJZ. PIC:

GAP: THE PERFECT ANTENNA

We at GAP realize there isn't a perfect antenna. No singular antenna will scream DX on 80 and be the best for local nets on 10. If anyone tells you there is, beware! The perfect antenna does not exist, but the right one for you may. If you want something to bust the pile on the low bands, then consider the Voyager. Just starting out in ham radio and need a great general coverage antenna, the Challenger is easy to assemble and for little effort will yield superior performance, especially on DX. Maybe you knowingly or unknowingly moved into one of those "restricted areas" where the Eagle's limited visibility, but unlimited ability is desired.


Eagle DX

Challenger DX


Voyager DX

This chart helps you select the right GAP antenna. When comparing GAPs, bandwidth is not a concern. With few exceptions, a GAP yields continuous coverage under 2:1 for the **ENTIRE BAND**.

All antennas utilize a GAP elevated asymmetric feed. A major benefit is the virtual elimination of the earth loss, so more RF radiates into the air instead of the ground. This feed is why a GAP requires **NO RADIALS**. Just as elevating a GAP offers no significant improvement to its performance, adding radials won't either, making set up a breeze.

A GAP antenna has no traps, coils or transformers. This is important. The greatest sources of failure in multiband antennas are these devices. Perhaps you heard someone discuss a trap that had melted, arced or became full of water. Improvements to these inherent problems are the focus of the antenna manufacturer, while the basic design of the antenna remains unchanged. **GAP improved the trap by eliminating it!** Removing these devices means they don't have to be tuned and, more importantly, won't be detuned by the first ice or rain. The absence of these devices improves antenna reliability, stability and increases bandwidth.

Another major advantage to a GAP antenna is its NO tune feature. Screws are simply inserted into predrilled holes with a supplied nutdriver.

The secret is out and people in the know say:

CQ–"The GAP consistently outperformed base-fed antennas...and was quieter."

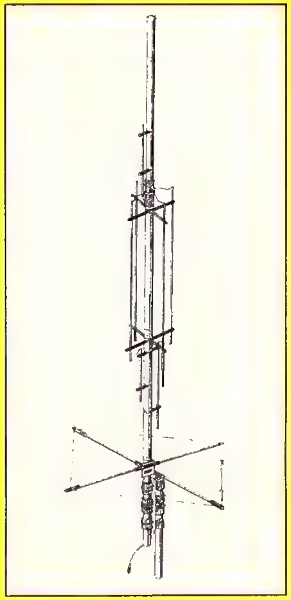
73–"This is a real DX antenna, much quieter than other verticals."

RF–"To say this antenna is effective would be a real understatement. Switching back and forth on 40m between another multiband HF vertical and the GAP, there was no comparison. Signals were always stronger on the GAP, sometimes by S units, not just DB's."

Worldradio – "These guys have solved the problem associated with verticals. That is, an awful lot of RF is wallowing around and dropping into the dirt instead of going outward bound. A half-wave vertical does need radials if it is end fed (at the bottom). But the same half-wave vertical does not (as much, hardly at all) if is fed in the center."

IEEE–"Near field and power density analyses show another advantage of this antenna (asymmetric vertical dipole): it decreases the power density close to the ground, and so avoids power dissipation in the soil below it. The input impedance is very stable and almost independent of ground conductivity. This antenna can operate with high radiation efficiency in the MF AM standard broadcast band, without the classical buried ground plane, so as to yield easier installation and maintenance."

Latest Release: **TITAN DX**



This all purpose antenna is designed to operate 10m-80m, WARC bands included. It sits on a 1-1/4" pipe and can be mounted close to the ground or up on a roof. Its bandwidth and no tune feature make it an ideal antenna for the limited space environment as well as a terrific addition to the antenna farm.

MODEL	BANDS OF OPERATION											HT	WT	MOUNT	COUNTER-POISE	COST
	2m	6m	10m	12m	15m	17m	20m	30m	40m	80m	160m					
Challenger DX	■	■	■	■	■		■		■	■		31.5'	21 lbs	Drop In Ground Mount	3 Wires @ 25'	$259
Eagle DX			■	■	■	■	■		■			21.5'	19 lbs	1-1/4" pipe	80" Rigid	$269
Titan DX			■	■	■	■	■	■	■	■		25'	25 lbs	1-1/4" pipe	80" Rigid	$299
Voyager DX							■		■	■	■	45'	39 lbs	Hinged Base	3 Wires @ 57'	$399

GAP

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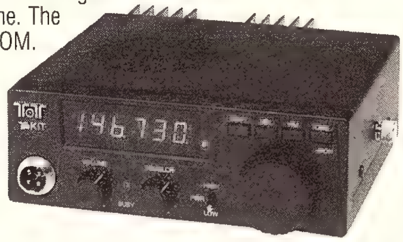
2 METER FM TRANSCEIVER

Building a sophisticated microprocessor-controlled rig is easy with our step-by-step assembly manual. You build in sections and then make progress tests along the way. Added benefit is the knowledge to maintain it yourself for years to come. The only essential test equipment is a VOM.

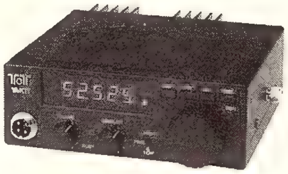


- Encoder tunes 143.5 - 148.5 in 5 kHz steps (or 2.5 kHz)
- 15 memories store repeater offset and subaudible tones
- Stores non-standard split (CAP, MARS)
- Built-in subaudible tone encoder
- Instantaneous PIN diode T/R switching
- Packet-ready with rear panel DIN connector (1200 baud)
- Large LED readout
- Build it now 5 or 30 watts, or upgrade to 30 watts later
- Complete enclosure, mike, and mobile bracket included
- 2.25"H x 6.5"W x 6.75"D or 7.75"D for 30 watts

Build in 25 hrs

1220	5 wattts out	$195*
1222	30 watt module	$ 64*

6 METER FM TRANSCEIVER

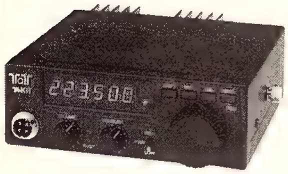


Same features as 2 meter model.
Covers 50.095 - 54.1 MHz.

1260............5 watts out........................$195*

(sorry, FCC rules forbid sales of add-on power amp)

222 MHz FM TRANSCEIVER



Same features as 2 and 6 meter models. Covers 222 - 225 MHz in 10 kHz steps. 4 watts out on low power, 20 watts out on high.

1230..$295*

EXPLORE 6 METERS FOR ONLY $95

No need to buy a complete transceiver to discover the fun of 6 meters. T-Kit offers two transverters to choose from. **Model 1209** converts your 2 meter handheld or mobile rig to 6. All features and modes on your 2 meter rig immediately available on 6 (FM SSB CW). Tune 144 -148 MHz to work 50 - 54 MHz. **Model 1208** converts any modern HF rig with 20 meters to 6. Tune 14 -16 MHz to work 50 - 52 MHz.

Build in 12 hrs

- 5 watts max input delivers 8 watts out
- Silent RF-sense PIN diode T/R switching
- Only 1.3"H x 7.25"W x 6.125"D
- Simple hookup, no mods needed to most rigs

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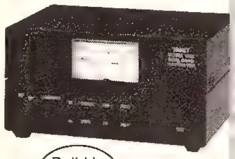

Connectors for both HF and VHF let you leave meter in line with BOTH rigs. Front panel switch between HF and 2 meters. Measure power or SWR on 20 or 200 watt ranges.
1.8 - 30 MHz and 144 - 148 MHz.

Build in 6 hrs

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Build in 25 hrs

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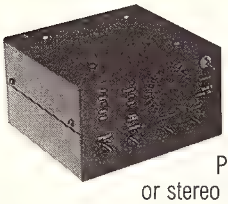
9-BAND SWL RECEIVER



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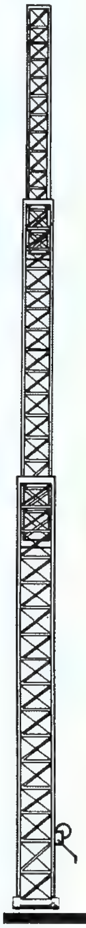

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MA-550	55'	22'1"	3	435	3"sq.	6"	$1521
MA-550MDP*	55'	22'1"	3	620	3"sq	6'	$3258
MA-770	71'	22'10"	4	645	3"sq.	8"	$2810
MA-770MDP*	71'	22'10"	4	830	3"sq.	8"	$4445
MA-850MDP*	85'	23'6"	5	1128	3"sq.	10"	$5991

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TX-438	38'	21'6"	2	355	12 1/2"	15"	$1269
TX-455	55'	22'	3	670	12 1/2"	18"	$1710
TX-472	72'	22'8"	4	1040	12 1/2"	21 5/8"	$3147
TX-472MDP*	72'	22'8"	4	1210	12 1/2"	21 5/8"	$3799
TX-489	89	23'4"	5	1590	12 1/2"	25 5/8"	$5475
TX-489MDPL*	89	23'4"	5	1800	12 1/2"	25 5/8"	$8212

* TX-472MDP includes heavy duty motor drive with positive pull down.
TX-489MDPL comes with heavy duty motor drive with dual level wind and positive pull down
MDPL models include fully operational limit switch packages.

FREE STANDING HEAVY-DUTY CRANK-UP TOWERS
Will handle 30 sq. ft. antennas at 50 MPH winds.

MODEL NO.	HEIGHT MAX.	HEIGHT MIN.	NUMBER SECTIONS	WEIGHT POUNDS	SEC. OD Top.	SEC. OD Bot.	SUGGESTED HAM PRICE
HDX-538	38	21'6"	2	600	15"	18"	$1642
HDX-555	55'	22'	3	870	15"	21 5/8"	$2874
HDX-572	72'	22'8"	4	1420	15"	25 5/8"	$4927
HDX-572MDPL*	72'	22'8"	4	1600	15"	25 5/8"	$7528
HDX-589MDPL*	89'	23'8"	5	2440	15"	30 5/8"	$9855
HDX-689MDPL*	89'	23'8"	5	3450	18"	37 1/8"	$19,039
HDX-5106MDPL*	106	24'8"	6	3700	15"	37 1/8"	$20,719

* Includes heavy-duty motor drives with dual level wind and positive pull down. MDPL models include fully operational limit switch packages
*HDX-689MDPL rated at 60 sq. ft. of antenna at 50 mph winds. * HDX-5106MDPL rated at 35 sq. ft. of antenna at 50 mph winds

FREE STANDING "LOW PROFILE" COMPACT CRANK-UP TOWERS
Will handle 18 sq. ft. antennas at 50 MPH winds. (TMM-433HD handles 24 sq. ft.)

MODEL NO.	HEIGHT MAX.	HEIGHT MIN.	NUMBER SECTIONS	WEIGHT POUNDS	SEC. OD Top.	SEC. OD Bot.	SUGGESTED HAM PRICE
TMM-433SS*	33'	11'4"	4	315	10"	18"	$1355
TMM-433HD*	33'	11'4"	4	400	12 1/2"	20 7/8"	$1642
TMM-541SS*	41'	12'	5	430	10"	20 7/8"	$1779

* Rotators must be top mounted

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WA6OWH. SGL: N6IG, OOC: WY6O. ACC: W6RFF. These are the volunteers that keep the section running smoothly! A list of all the section appointees can be found on the section Web page. The division page is www.pdarrl.org. As of June, we still have rain, so no fires as yet, but be prepared to help out your emergency coordinator or ARES/RACES groups as things dry up. Enjoyed a dinner meeting with the Yolo ARS in Davis and they have been busy with Public Service work. The Yuba-Sutter RC will be meeting the 2nd Wed/ mo. at the Yuba City Mall at 7 PM. They have been unable to find a permanent meeting place. Nevada County ARC gave communications support for the Scott's Flat Horse Run (more than 12 hours). New NCARC members; KF6QK, W6IXO, KB6DKJ, KF6IZP, KF6QVX. Berryessa ARK held their annual meeting in Woodland-new memb. KD7AUF, KF6HPJ, KE6SSK, KC7WCE. River City ARCS member AA6DJ retired as their training director and teacher. Lyle taught hundreds of new hams and acted as an Elmer to many others. A job well done Lyle!! Hamswap in Placerville every 3rd Sunday. Contact KE6BUU for info. E-mail jwilson@inforum.net. KO6DJ is a new OO, having passed the Amateur Auxiliary exam. Congrats Rick. K6EKB is a new director for sacto. ARC and is building a web site for the club. SARC has moved their meetings back to the Sacramento Blood Bank, but to the Henderson Annex. Shasta Cascade ARS participated in the Redding Rodeo Parade for the 18th year. W6SUE was the coordinator. Good work, Susie. I enjoyed an interesting meeting with Golden Empire ARS in Chico. SV Section Net: 8 PM, 1st Sunday/month. On 146.085+. 73.

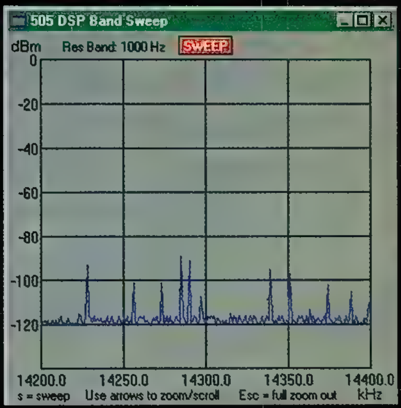
SAN FRANCISCO: SM, John Wallack, W6TLK—Packet, W6TLK@KJ6FY. ASMs: N6KM, KE6EAQ. PIC: N6BWS. SEC: WB6TMS. TC: N1AL. With sadness I report the following Silent Key: WN6C. New Appointments: KD6VWD, OOC; KD6CJQ, DEC, Sonoma County. Humboldt ARC is now a Special Service Club. KE6EAQ, ASM, Sonoma County RA, was instrumental in having the Santa Rosa City Council declare the week of June 21-27 "Amateur Radio Week." KN6ZU, Southern Humboldt ARC, reports that 21 hams provided comm for the annual 100 mile Tour of the Unknown Coast bike race. This is an extremely challenging bicycle race in a very isolated coastal area where ham radio provides the best means of comm. NN6D, SFARC, reports that K6TW and K6TR donated a 2nd repeater to their club. New club officers at Willits ARS are W6OO, N6OUW, KD6LSQ and W6JCG. N6GJM reports a very good turnout at the recent Lake County Repeater Swap. Treasure hunts using radio direction finding are an increasingly popular event for several clubs. T hunts build skills in tracking and locating interfering signals. Clubs may also be interested in having club competitions. Some clubs that either have active T hunt programs or are interested in these events are SFARC, Sonoma County RA, Lambda ARC, Marin ARC, Willits ARS.

SAN JOAQUIN VALLEY: SM, Donald Costello, W7WN—ASM: Mike Siegel, KI6PR. ASM: Tech John Lee, K6YK. SEC: Kent LeBarts, K6IN. OOC: Victor Magana, AA6AH. John Lee, K6YK, reports that there is an increase in activity on VHF/UHF SSB and Satellite in the section. The 2-meter SSB net meets on Sundays and is averaging 50 check-ins per week. On the 50 MHz scene the 6 meter SSB net is held on Sunday at 7:30 PM on 50.130 MHz. Aim your antennas to the north as net ops are in Sacramento. John also reports having visited the Stockton Delta ARC where he gave a talk on amateur satellite communications. Thanks John. I am pleased to announce the appointments of Hank Lane, N5UON, to the post of Technical Specialist. Hank is a HAM with extensive experience in commercial communications. I am pleased to announce that, pending completion of required testing, that Jim Jones, N6UGH, will join the ranks of the Amateur Auxiliary as an OO. Larry DeWitt, WB6GJT, has conveyed his regrets that, for personal reasons, he can no longer continue in the post of Section Emergency Coordinator. I am sorry to see Larry step down but, understand his reasons. Thank you, Larry, for your help as SEC. Phillip Atchley, KO6BB, has been appointed to the post of Asst. EC for Merced County. Thank you Phillip for your help with emergency communications in Merced County and congratulations on your appointment recommended by Kent LeBarts, K6IN, EC for Merced County. Speaking of Kent LeBarts, K6IN, Kent will succeed Larry DeWitt, WB6GJT, to the post of section emergency coordinator.

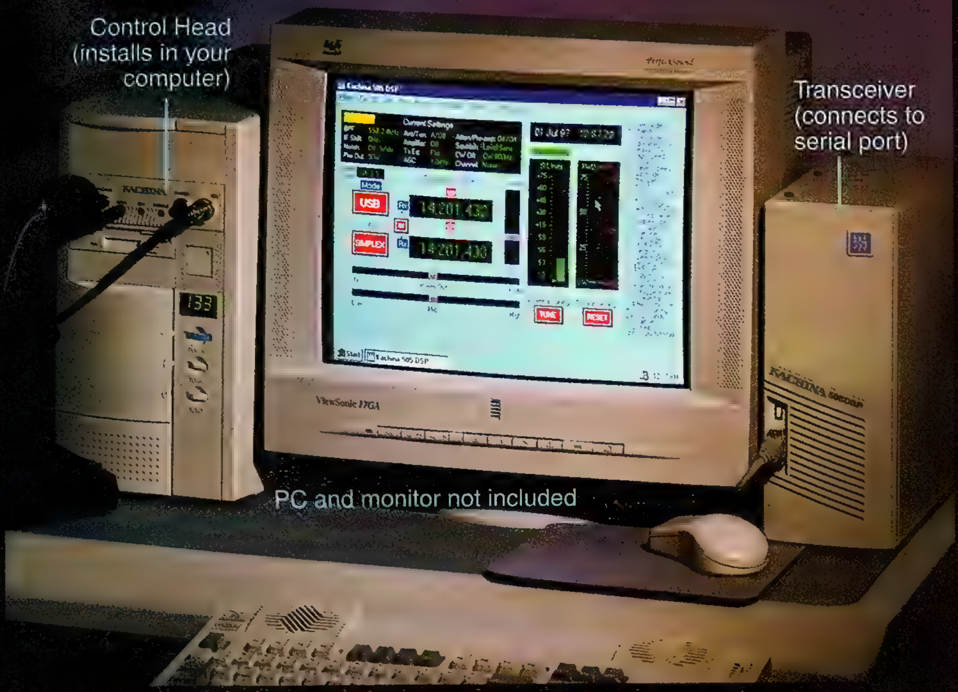
SANTA CLARA VALLEY: There is a new section manager: Geoffrey Ellis, KD6MFM. More news of the section will be provided next month.

ROANOKE DIVISION

NORTH CAROLINA: SM, W. Reed Whitten, AB4W—ASMs: AB4S, KE4ML, KC4ACE. SEC: K4MPJ. ASECs: WA4MOK, N4UCO, KD4RYE. STM: K4IWW. ASTM: W4EAT. TC: K4ITL. SGL: KI4AN. OOC: W4ZRA. PIC: KN4AQ. ACC: W4CC. BM: KD4YTU. Web site <http://www.ncarrl.org>. Results of the 1997 ARRL Simulated Emergency Test (SET) were published in July *QST* (p 52). North Carolina had the top score in both ARES activity and Local/Section Nets. CONGRATULATIONS and THANKS to everyone who participated. Your efforts made this possible. Our top ARES score was a group effort involving Granville, Person, Warren, and Vance counties. Individual counties scoring over 500 points each were Guilford, Buncombe, Pitt, Wake, and Johnston. The top net score was Guilford. Granville, Johnston, Pitt, the Tar Heel Emergency Net, and Buncombe counties followed. Triad SKYWARN made a big contribution in both categories. What about the 1998 SET coming in October? We will try to defend our first place, and also try to involve our neighbors in a multi-section exercise. Last year's Field Day efforts included some high scores, including a few first places. Hope we see the same this year, and hope everyone had a good time on this important emergency exercise. These exercises, our NTS nets, ARES nets/activities, and our public service work all improve our capability to provide emergency communications. The cooperation we have between NTS, ARES, and Amateur Radio Clubs is most important to our success. We can all be proud of what North Carolina amateurs have accomplished. Special thanks to SEC K4MPJ, STM K4IWW, and the other section officials who make our Field Organization work. Even more important is the contribution from each individual amateur. Shelby Hamfest with an ARES meeting and NTS lunch, Sep 5-6; Monroe Hamfest Sep 12; Virginia Beach Hamfest & Roanoke Div. Conven-



"Band Sweep" window allows you to look for the pile-ups. "Point and click" the mouse to instantly change frequency and join in.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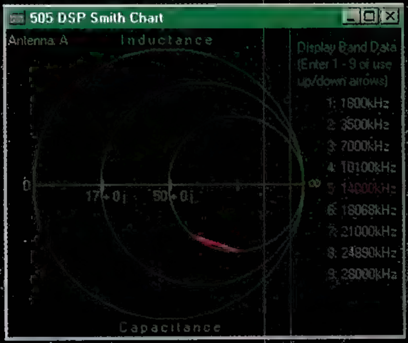

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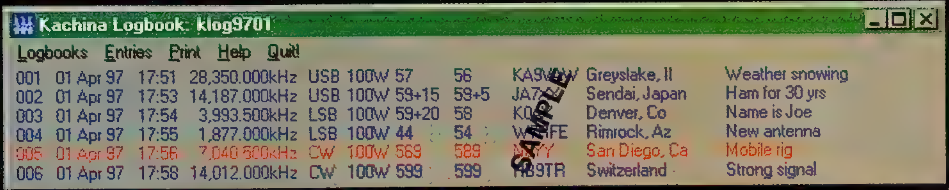

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001  01 Apr 97  17:51  28,350.000kHz  USB 100W 57     56    KA9VAW  Greyslake, Il    Weather snowing
002  01 Apr 97  17:53  14,187.000kHz  USB 100W 59+15  59+5  JA7     Sendai, Japan    Ham for 30 yrs
003  01 Apr 97  17:54   3,993.500kHz  LSB 100W 59+20  58    K0      Denver, Co       Name is Joe
004  01 Apr 97  17:55   1,877.000kHz  LSB 100W 44     54    W  FE   Rimrock, Az      New antenna
005  01 Apr 97  17:56   7,040.500kHz  CW  100W 569    589   N  YY   San Diego, Ca    Mobile rig
006  01 Apr 97  17:58  14,012.000kHz  CW  100W 599    599   HB9TR   Switzerland      Strong signal
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SOUTH CAROLINA: SM, Les Shattuck, K4NK—S.C. SSB NET, 7 PM, local, 3.915. I have been section manager for almost a year now. I have tried to get around to visit as many clubs as I could. I have been able to make most all the Hamfests. It will be my policy to continue these visits and if your club would like me to be a guest speaker please contact me. Very soon it will be time to make a decision to run for office. As you know I was appointed to fill Dave Berry's term. There will be an election this fall for a new section manager. I have enjoyed this job and feel at this time I will run for the position. With the sunspots increasing I have heard a lot of good DX rolling in. I am taking down my little 3 element Jr tribander and putting up a TH5DXS. How about dropping me a line telling what you're doing on the bands. Hope all the clubs had a great Field Day. Traffic: AE4UB 204, KT4SJ 108, W4DRF 104, KA4LRM 64, KT4FP 36, WA4UGD 32, KA4UIV 31, WD4BUH 23, KF4HAV 22, W4CQB 15, K4GDL 14, KQ4SY 14, K4NK 8, WT4F 5. PHSR: AE4UB 138, KA4UIV 128, KT4SJ 108, KA4LRM 90.

VIRGINIA: SM, Lynn Gahagan, AF4CD—ASM: Terry McCrickard, W4TLM. SEC: Frank Mackey, K4EC. STM: Anthony Brookes, KU4RG. ACC: Vacant. BM: Vacant. SGL: Frank Brooks, W4UMC. TC: Richard Graziano, W3ERD. OOC: Tony Amato, KR4UQ. PIC: Gary Martin, W2MG. I would like to take this opportunity to thank Geri Sweeney, N4GHI, the STM for over 10 years for her dedication and service to the VA. Section. Geri and her husband John, N6ANQ, relocated from northern VA last year after John retired to Cobbs Creek, VA. They are planning to do a lot of traveling and sailing later on this year and Geri thought that it would be best that she stepped down as the section's STM. She assured me that they will still remain active in the NTS, and I look forward to hearing from them as they travel about. I wish that I had the opportunity to do the same. Anthony Brookes, KU4RG, will become the section's new STM. Anthony lives in Rocky Mount, located in Franklin Co, District 13. He has been very active with several clubs and with the ARES/RACES. Anthony is presently the net manager for the VSBN along with many other activities in the section. He will be streamlining all of the activities down to concentrate on the STM job, which will now take up many hours of his time. I hope that everyone will give him the support that he will need. The Old Dominion Emergency Net will be held twice a month starting in July. It will be held the 1st and 3rd Mondays of each month. This net was started around April '97 and attendance has grown each time we call the net. I would like to see all of the 15 districts have representatives present at each session. The purpose of the net is to test propagation, exchange ideas, and for training throughout the state. The frequency is 3.947 MHz and starts at 6:30 PM local time and all amateurs are encouraged to participate. I just got back from the Manassas Hamfest earlier in the week and enjoyed it very much. Thanks to everyone who was responsible for putting on a great time. Looking ahead in September, the Roanoke Division Convention will be held at the VA Beach Hamfest on the 19th and 20th. Bill Moore, NC1L; John Kanode, N4MM; along with section leadership from all over the division are planning to attend This is the largest hamfest that we have in the state, and beginning again this year THERE WILL BE TAILGATING! 73 de AF4CD. Tfc: K4DOR 558, N4GHI 312, WD4MIS 233, KF4FXT 214, N4ABM 194, K4MTX 150, KE4AZL 110, WB4ZNB 86, N6ANQ 84, KR4MU 83, KU4RG 64, WA4DOX 62, WB4KSG 46, K4PRR 42, W4UQ 40, W4YE 31, W4CAC 31, K4IX 23, W4JLS 22, K4YVX 19, W4TZC 15, KN4US 14, WB4UHC 12, W3ATQ 10, KB4CAU 6, KF4HJW 5, WB2KQG 4, N4FNT 2, KE4NYY 2, W4IN 2, K4JM 1.

WEST VIRGINIA: SM, O.N. (Olie) Rinehart , WD8V—STM: WD8DLY. SEC: K8QEW. ASEC: KA8ZOO. SGL: K8BS. TC: K8LG. OOC: N8OYY. ACC: WD8MKS. Digital: KA8MHR, APRS: W8XF. The propagation has really been strange as you all know. A good example is an operation of a net that I was involved in. While mobile in Richmond, Virginia, I checked into the 8RN Early Net on 7.240 from the parking lot of the motel where I was staying. I found that a net control station and Michigan, Ohio and West Virginia reps could not copy each other. I could copy all, and all could copy me! The net was conducted with full relays from my mobile! Should every station have a vertical antenna as a backup!? We here in WV are not alone of course but we have had our share of unusual weather and the various ARES/RACES groups are to be congratulated for their conduct of emergency weather and SKYWARN activities. Too numerous to mention each one but a Gold Star to you all! Public service is our keynote and the public and government is thankful we are there! See you at "The Mill." Tfc:WD8V 319, K8MHR 263, KA8WNO 178, W8IMX 93, N8OYY 87, K8QEW 58, WD8DHC 48, WL7COO 48, W8FZP 42, W8JWX 13, PSHR: K8MHR 416, WD8V-373, KA8WNO 138, WD8DHC 138, W8IMX-138, WL7COO 104.WVFN Daily 18:00 E 3.865, 1163/162/825/31 N8OYY; WVMDN Daily 11:45 E 7.235, 412/29/423/26 WD8DHC; WVNE Daily 19:00 3.567, 178/101/325/31 W8IMX; WVNL Daily 22:00 E 3.567 160/59/280/31 W8IMX; ARES/RACES 36 NETS/STA 1261/TRF 40/MIN 2160 K8QEW; DIGITAL connects 46 /208 traffic K8MHR.

ROCKY MOUNTAIN DIVISION

COLORADO: SM, Tim Armagost, WB0TUB—Assistant Section Manager: Jeff Ryan, N0WPA. Section Emergency Coordinator: Mike Morgan, N5LPZ. Section Traffic Manager: Mike Stansberry, K0TER. Affiliated Club Coordinator: Ron Deutsch, NK0P. Public Information Coordinator: Open. Official Observer Coordinators: Karen Schultz, KA0CDN & Glenn Schultz, W0IJR. Section Government Liaison: Mark Baker, KG0PA. Technical Coordinator: Bob Armstrong, AE0B. Bulletin Manager: Jerry Cassidy, N0MYY. Are you interested in helping to implement and manage League programs in Colorado? Your section is always looking for volunteers. Station appointments such as official emergency station, official relay station and official bulletin station are available. If you want to help with

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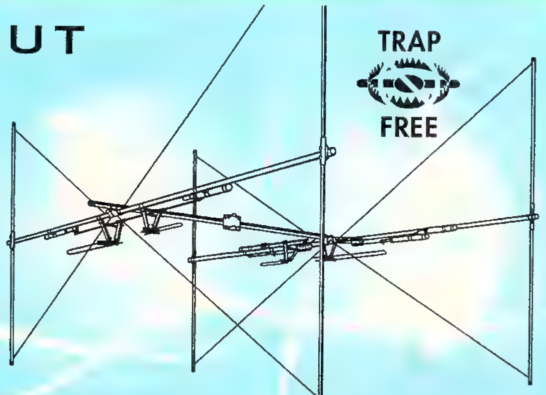

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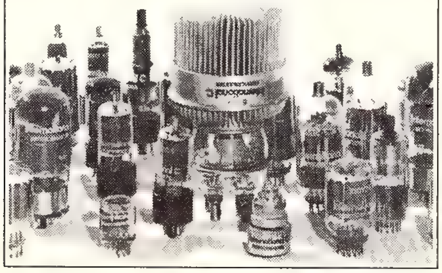

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emergency services, traffic, public information or as a technical specialist, there's a place for you. I've spelled out the section staff appointments this month so newer folks can see the actual titles. Contact the appropriate staff member, Tim or me if you can help or need more information. Public service season is in full swing; listen to the state-wide ARES nets on Sunday mornings: HF: 3928 kHz at 0800L and VHF on the Colorado Connection repeaters at 0830L. The last time I did an Internet search on "Colorado"+"Amateur Radio," I received well over 400 'hits"—so there's loads of info out there, and more and more clubs/groups are posting their own Web pages. Packet SysOps: please participate in the regular surveys sent out by Bill, K0RZ. The resultant directory of Colorado Packet BBS/Nodes is distributed throughout the state and posted on the TAPR North American Digital Systems Directory. 73 de N0WPA.

NEW MEXICO: SM, Joe T. Knight, W5PDY—ASM: K5BIS & N5ART. SEC: K6YEJ. STM: N7IOM. NMS: WA5UNO & WA5UWY. TC: W8GY. ACC: N5ART. New Mexico Roadrunner Net meets daily at 3939 @ 0100 UTC and handled 133 msgs with 1155 checkins. New Mexico Breakfast Club meets daily, 3939 @ 6:30 AM and handled 182 msgs with 1088 checkins. Yucca 2-mtr Net 78/18 handled 18 msgs with 754 checkins. Caravan Club 2-mtr Net, 66/06 handled 3 msgs with 85 checkins. SCAT Net, 66/06 handled 16 msgs with 556 checkins. Four Corners Net handled 15 msgs with 328 checkins. GARS Net handled 4 msgs with 32 checkins. QCWA Net handled 1 msg with 17 checkins. Rusty's Raiders, 94/96, with 106 msgs and 646 checkins. Valencia County Net handled 2 msgs with 29 checkins. The Annual Mega-Munch at Conchas Lake State Park was an outstanding success with lots of excellent food and about 70+ in attendance. WA5IHL & KC5BPB, with all their helpers, are due a big vote of thanks! KA5BAT and crew gave exams and at least one Amateur Extra & one Advanced Class license passed, and several other exams were given with a high pass rate. Alamogordo Hamfest is scheduled for September 5th at the Otero County Fair Grounds. The New Mexico State Hamfest will be held at the National Guard Armory just north of Rio Rancho, NM, a short distance northwest of Albuquerque. This event is scheduled for September 19-20. Will have free admission, ARRL Forum, ARRL VE Exams, SAR Forum, Antique Radio Display, and much more. Info at dchf@qsl.net.

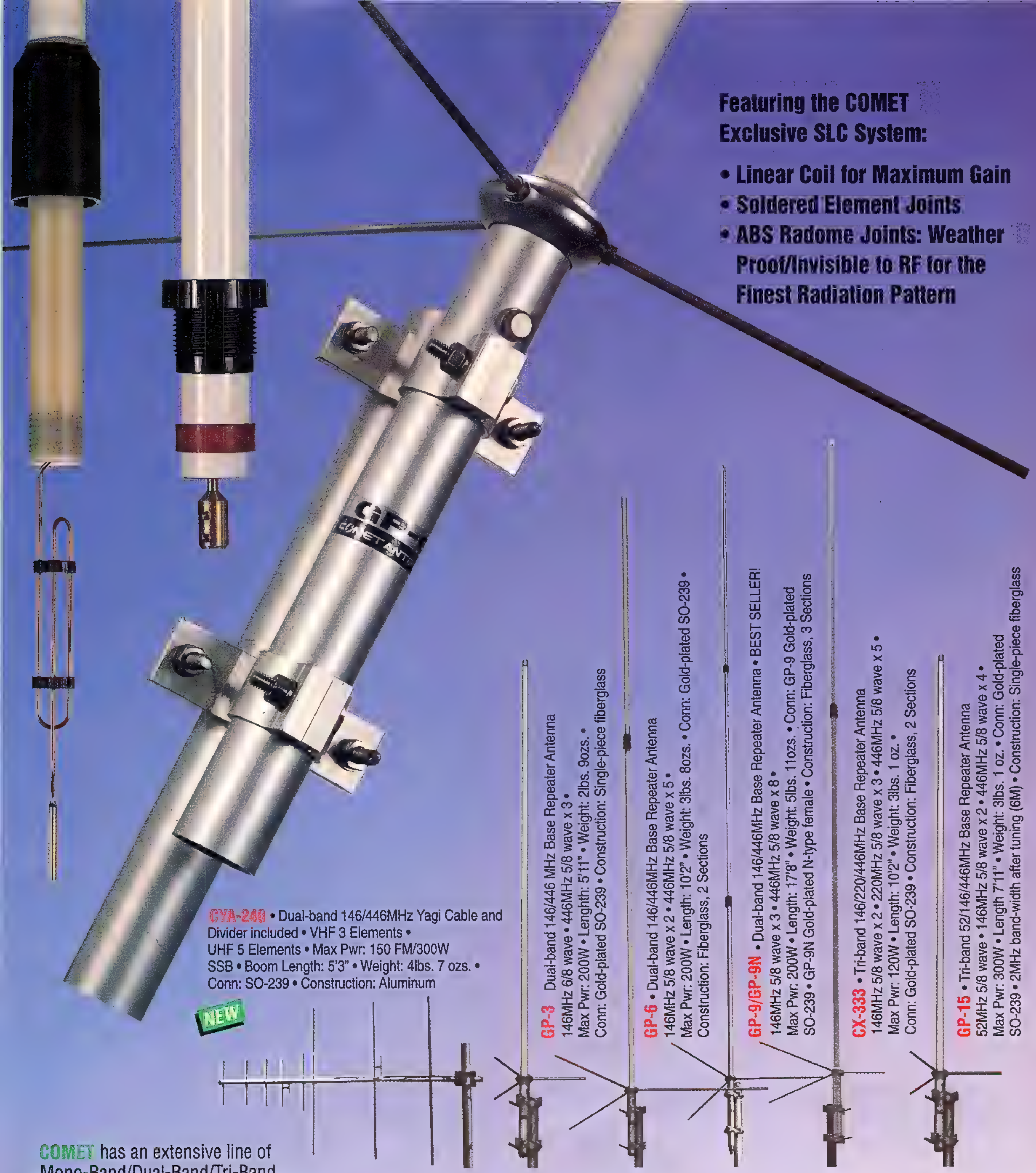
UTAH: SM, Jim Rudnicki, NZ7T—Greetings. The latest threat to the 440 MHz band by the LMCC (Land Mobile Communications Council) is another example of the continued threat to our frequencies by commercial agencies. As amateurs we must ensure we are heard and represented. Check out the ARRL's response at www.arrl.org/news/bandthreat/RM-9267/arrl-cmt.html. Linda Reeder, N7HVF, has been out and about giving club presentations on the role of women in Amateur Radio. She is a YL of great energy and ham radio enthusiasm. Nice to hear so many new Utah hams on the "magic band" during the 1998 VHF Test, most I have ever heard! Sure can tell the newer rigs have 6M! Guess I will have to break down and put up a real antenna for 6 HI! Don't forget the VHF RACES Nets on August 20. Check with your local EC for the repeater frequency in your area. Did you catch the nice write-up from Sinbad Desert ARC in last month's *QST*? (July *QST* p 92!) Congrats to KA7LEG, KC7UVN, and KJ7HM of the Sinbad Desert ARC for their fine work at Helper JHS. Davis ARC planning another exciting JOTA for this October. UARC's Microvolt continues to look better and better, now including pictures! Not much else to write this month. Let me know what your club is up to these days. Tfc: W7MEL: 34. 73 de NZ7T.

WYOMING: SM, Bob Williams, N7LKH—The WY Section support for the March of Dimes Walkathon was effective and appreciated by that organization. In fact, we are already asked to do it again next year so plan ahead. Of the 16 towns for which we were asked for communications support we were able to staff up for 15. In each case the lead person was an EC or local club officer. I list them here for the credit they deserve: Casper-Dave Reigert, KB7WON, and Rev Morton, WS7W; Cheyenne-Marty Luna, KJ7JJ; Cody-Lynn Knapp, K7IKO; Douglas-Quent Vinzant, NX7Z; Evanston,-David Smith, WA7MEK; Jackson-Mick Dettmer, KC7FAL; Kemmerer-Cliff Turner, W7PIF; Laramie-Wayne Sutherland, NQ7Q; Lusk-Dennis Green, N7QJN; Rawlins/Saratoga-Charles Pulaski, KC7JFX; Riverton-Dave Herbert, N6LW; Sheridan-Bud Clark, WA7D; Wheatland-Terry Meier, WA7SNU; and Worland-Rob Underwood, K7EMR. We are being asked to provide Ham Com for a Bike Ride over the Big Horn Mountains from Cody to Sheridan. Net Reports for May: Wyoming Cowboy-WB7K, 679/1/21; HERC-K7EMR, 216/1/5; Pony Express-NE7C, 235/1/5.

SOUTHEASTERN DIVISION

ALABAMA: SM, Scott Johnston, N4YYQ—ASMS: WX4I, N4ZNO, KL7P, KB4KOY, KT4XA, KT4JW, KC4RNF, KR4TZ, KX4J, KA4PKP. STM: WB4GM. OOC: KL7Q. TC: KC4RNF. SEC: AE4WP. ACC: K4LI. BM: KA4ZXL. Hope everyone has enjoyed their summer so far. The summer may be winding down, but the heat and humidity hasn't, so still exercise caution when you're out and about, okay? I would like to remind everyone about the Huntsville, Alabama, hamfest. It's coming up August 15-16, 1998. It will be an ARRL Alabama section convention. So please do try to fit in your schedule a visit up to Huntsville this year. It should, as always, be a terrific event. I'd like to extend hearty congratulations to one of our hams here in Alabama. Congratulations to Jack Evans, KC4PZA! He was our Ham of the Month for June '98. Jack, you're doing a great job. Keep up the good work. Thanks to everyone who has been sending in their end of the month reports to Gene, WB4GM, Joey, AE4WP, and myself. Keep'em rolling in folks! Tfc: WB4GM 276, N4ZNO 169, W4PIM 142, W4CKS 141, N4YYQ 80, KL7Q 65, WA4GQS 57, WA4LXP 43, WA4MTG 33, AF4HE 32, KC4RNF 31, KU4IJ 31, W4ZBA 24, KD4PDQ 23, AC4CS 19, W4ZGY 16, W4XI 16, W4DGH 14, WB4TVY 10, AE4EI 9, KE4OLE 0, KS4FT 0.

GEORGIA: SM, Sandy Donahue, W4RU—ASM/So GA: Marshall Thigpen, W4IS. ASM/Legal: Jim Altman, W4UCK. SEC: Tom Rogers, KR4OL. STM: Dick Baxter, K5TF. SGL: Charles Griffin, WB4UVW. TC: Eddie Kosobucki, K4JNL, ACC: Jud Whatley, W4NZJ, OOC/RFI: Ed Tanton, N4XY. At the Atlanta Hamfest in June we were honored to host a



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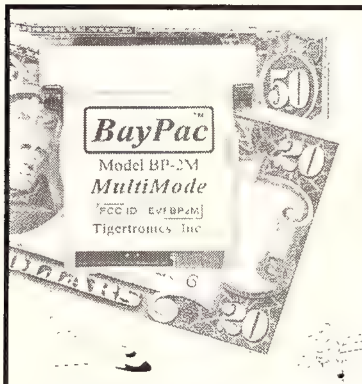

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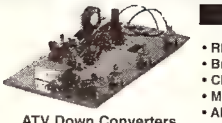

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Southeastern regional ARES conference. For a solid afternoon we heard encouraging and challenging words from those who depend upon hams for communications in emergencies. Gary McConnell, Director of GEMA was there. Steve Hailey, Communications Coordinator for the Red Cross HQ in Washington was there. Jerry Herman, Hurricane Watch Net Mgr visited, as did Don Stephens of the GA Red Cross. Representing the NWS was Patricia Hart, and Ted Wynn observed as the state director of APCO. The purpose of the conference was to bring together the amateurs in this region with the agencies we serve. They told us what they wanted and we explained what we could provide. After the experiences with floods and tornadoes this spring, the opportunity for the hams and the agencies to meet and communicate was enlightening to both sides. My deepest thanks for organizing this event go to Tom Rogers, your SEC, and the best SEC on the planet, and to Rick Palm, K1CE, from ARRL HQ staff, who paid for it. New officers at GA Tech ARC: pres KE4QLI, vp KF4UZB, sec KF4UZC, tres N3NGG, Shack Steward, KF4UZB. Our condolences to the family of James Oxford, KD4QHD, Watkinsville, who passed away in June. 73. Tfc (April): K5TF 164*, WB4GGS 92 WU4C 92, KA4HHE 88*, W4AET 63*, K1FP 43, K4BEH 38* AD4KA 34, KE4NAY 26, K4BAI 1. Asterisk denotes PSHR qualifier.

NORTHERN FLORIDA: SM, Rudy Hubbard, WA4PUP—ASM-APRS: WY8O. ASM-Youth: KO4TT, ACC: W4UE. OOC: WB4GHU. PIC: KF4HFC, SEC: WA4NDA. SGL: KC4N. STM: WX4H. TC: KO4TT. PACKER: N4GMU. The major activity for the month of May was tornadoes. Alabama, Georgia and Florida experienced several with serious damage and several lives were lost due to the storms. Many were injured and many hams were on hand to assist the disaster agencies. They also submitted weather reports to the National Weather Service as the storms progressed. Most of the club newsletters contained information preparing for Field Day. It appears they are planning big operations and fun. Some have joined together to have a bigger and better Field Day. Hope you were one of those out having fun. For those that have not written your congressman, look on page 16 of June *QST*. A letter is already prepared and all you will have to do it copy it with the name of your congressman. Won't you take time to write now if you haven't already? We need to try and persuade Congress to pass the legislation protecting our frequencies. I have asked WY8O to contact the DECs to ascertain the APRS activity on 144.39 in the Northern Florida Section. It appears some have switched and some have not. Several complaints have been received by yours truly about the switch from 145.79 to 144.39. We all need to be on the same frequency if we are to pass traffic during emergencies. Hopefully, next month we will have a report for the section. The information will be on the ARES and NFPN Nets at such time the results of the study are completed. Everyone should be planning to attend the Jacksonville Hamfest the first weekend of August. Planning for the ARRL forums have begun, and the hamfest committees are expecting this one to be bigger and better. Certainly, the Northern Florida Section Staff will assist in every way possible to help achieve that objective. See you there. 73, Rudy. Tfc: KE4DNO 2155, WX4H 2032, AD4DO 307, NR2F 288, K4NFP 242, KE4OAV 227, WB2FGL 198, AF4GF 130, KD4SIV 126, KS4FB 104, KS4DW 100, W5MEN 101, AD4BL 69, KF4TQX 58, W4KIX 43, KF4DWF 39, N4JAQ 38, AB4PG 32, KC4FL 28, WA4EYU 26, KF4WUZ 25, K1JPG 23, KB4DCR 21, KJ4HS 20, WB2IMO 17, N4GMU 13, WB9GIU 10, WX4J 6, KU4LY 5, W8IM 4, AD4QH 2.

SOUTHERN FLORIDA: SM, Robert "Rip" Van Winkle, AA4HT 941-853-1400—ASM: KA4FZI 941-574-3467, ASM for Youth Activities: WB9SHT 407-336-5608, STM/ASM: K4PG (WV5Z) 407-496-5257, SEC: W4SS 561-967-1477, Asst SECs: WB2WPA 941-775-2397, KD4GR 954-748-0775, TC: KI4T 954-791-4275, BM: WA4EIC 941-543-4853, PIC: WA4ATF 813-733-9441, OOC: WB4GHU 941-665-6708, ACC: W3BLW 813-541-2895, SGL: KC4N 904-385-5924, Pkt Mgr: KB4VOL 407-546-2532. By the time you read this, and you are an ARRL member, you should have received your ballot for the Southern Florida Section Manager Election. There are three candidates for the office so DON'T throw that ballot away. Exercise your rights as a League member and cast your ballot for the candidate of your choice. The section manager's term is for two years. Received a note from Gary Arnold, WB2WPA, Asst SEC SFL, that the annual ARES/RACES training session held during the 12th annual Governor's Hurricane Conference was a huge success. The training session was held on Monday, June 1, in Tampa with nearly 100 hams and professional emergency managers in attendance. The session lasted 3½ hours with Manny, W4SS, SEC SFL, Dick, AC4PF, NFL DEC, Dale, KG5QD, Collier Co. SKYWARN, John, WD4FFX, (FL DEM) and Gary, WB2WPA, SFL Asst SEC SFL, presenting information on ARES/RACES, SKYWARN, APRS enhancements, and an update on the state's emergency communications system along with other topics. Gary also mentioned that it was encouraging to see increased participation in the session from law enforcement agencies, fire/EMS and more emergency managers holding new amateur licenses. Congratulations to the ARA of SW Florida, the Polk Ham Club, the Indian River ARC, and the Hollywood ARC on being officially renewed as Special Service Clubs. These clubs have been very active and are recognized for being an asset to their community. I also want to thank George Baustert, W3BLW, Affiliated Club Coordinator SFL, for his work with the clubs in the section to help them become affiliated with ARRL or Special Service Clubs. Bruce Reid, WB9SHT, ASM for Youth Activities SFL, has recently sent out the Spring/Summer issue of the *Hamlet*, official newsletter for FYARC, and as usual did a super job. FYARC, Florida Youth Amateur Radio Clubs, continues to grow and in this month's newsletter, Bruce points out that he has acquired a couple of HF rigs to be given to school ham radio clubs. If you would like additional information on FYARC or have equipment to donate, Bruce's phone number is at top of the article or you can e-mail him at wb9sht@gate.net. It was great to read in the newsletters that I received that so many hams participated in the statewide hurricane exercise "Zeke." It was noted in the newsletters that the hurricane exercise pointed out those areas that needed improvement before a real hurricane came to visit. Just a reminder to emergency co-

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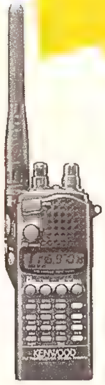

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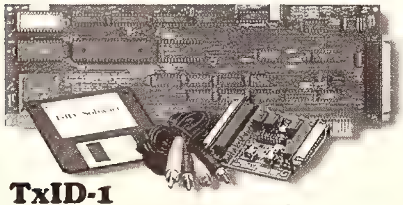

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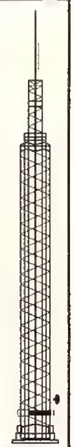

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VIRGIN ISLANDS: SM, John Ellis, NP2B, St Croix—ASM: Drew, NP2E, St Thomas. ASM: Mal, NP2L, St John, SEC: Vic, WP2P. St Croix. PIC: Lou, KV4JC. St Croix. ACC: Debbie, NP2DJ, St Thomas, NM Bob, VP2VI/W0DX, Tortola. Ron Hall, KP2N, and Ron Martin, WP2K, were interviewed by Anita Davis on the *Community Exchange* show on Radio One on the morning of May 26. They covered a number of topics concerning Amateur Radio in the Virgin Islands. The St John ARC will again participate in Field Day, this time from the Maho Bay National Park Pavillion. All visitors are invited to join. No word yet on St Thomas Field Day operations and the St Croix Club is planning to skip it this year due to a number of members being off island. Was good to see Mal, NP2L, along with XYL Susie, and to join them for dinner along with Jerry, WB6RCN, and wife Gloria, Lou, KV4JC, and my XYL Jeanette, NP2C, at Duggan's Reef restaurant. St Croix ARC still considering doing away with the monthly meetings and replacing same with weekly luncheons similar to those done by the St Thomas group. Hurricane season starting off quietly. Let's hope it remains that way. Remember if you have any section news, you can e-mail it to me at np2b@arrl.org. Always looking for news for the column. 73 de John, NP2B.

SOUTHWESTERN DIVISION

ARIZONA: SM, Clifford Hauser, KD6XH—As most of you already know, Barry Goldwater, K7UGA, passed away in late May. He was a champion of Amateur Radio and many people have visited and/or operated his large home radio station. He will be missed. There is talk of asking the FCC to retire (not re-issue) his call or have the Arizona state children's museum be allowed to use it for their station call sign. I am not 100% convinced about retiring the call sign. There are many other people who provided Amateur Radio with similar support. Let me know your thoughts on this matter by telephone, letter, or e-mail. Our own Lance Halle, KW7LH, has been awarded the Southwestern Division "Field Organization Volunteer of the Year" award. He has done a lot for Amateur Radio during the last several years and deserves this award. August is a slow month in respect to club activity because most clubs do not meet during the July/ August time frame. Many clubs are preparing for public service activities starting in September. These activities are a great way to practice emergency operation skills and help your community at the same time. How did your club do for Field Day? Send me pictures of your Field Day operation because I would like to try and get us some publicity in *QST*. It seems that all the Field Day activity pictures come from either the East or West Coast. Have you visited the Arizona State Science Museum and the CARL center? This is an active Amateur Radio station being supported and manned by volunteers to show the younger age groups what Amateur Radio is all about. Stop by and at least sign the guest book. If you can provide a little time to help man the station or even a little financial help, call Ralph Barr, W0DNO, at 602-582-8208. Don't forget the Southwestern Division Convention in August (24-26) in San Diego, California. I have all necessary information on topics, hotel, transportation, etc. There is almost no reason for you not to attend. Just a last minute note: Try not to let your ARRL membership expire. If you hold an ARRL volunteer position (ie OO, OBS, EC, etc), you must be a paid-up ARRL member to retain your appointment. See you at the Southwestern Convention in San Diego. 73, Clifford Hauser, KD6XH. Net QNI/QTC/sess: ATEN 1049/87/31; CAN (2 M) 181/43/29. Tfc: K7VVC 523, W7EP 88, AB7NK 70, W7DNJ 8.

LOS ANGELES: SM, Phineas J. Icenbice, Jr., W6BF—Now is the time to evaluate our radio spectrum allocations and decide how we can preserve them. The ARRL has addressed this problem, and we have a bill before the House, HR-3572. This is the "Spectrum Protection" bill, and it is the most important business that we must get passed through the US Congress. Without our spectrum assignments, we are headed up stream without a paddle. Please send your promotional ideas to HQ for publication in *QST*. The potential loss of our 440-MHz band privileges is just one way the political process is trying to nibble away at our spectrum holdings. We should fight for all "primary spectrum assignments." Traffic (totals) reported for May: AD0A, Jerry (56) and W6SX, Hank (36). Our great fellow American and promoter of Amateur Radio, K7UGA, Barry Goldwater is now a Silent Key. One of Barry's famous quotations: "Don't sell off your options too soon. Keep a few options open for future negotiations." The San Diego 1998 ARRL Southwestern Division Convention is August 14-16, at the Town & Country Convention Center. Free parking is available to convention attendees. (Hotel phone is: 1-800 77 ATLAS.) Our Queen Mary ARRL Convention is confirmed for 1999. Nate, K6OSC, and Jerry, AD0A, are working out the details with the local clubs. It is not too late to attend one of their planning meetings with your input. A Web site is established to provide an update of Queen Mary Convention planning. qsl.net/arrlsw/hamcon/ My new ARRL Web site is qsl.net/arrlsw/lax 73 de W6BF, Phineas.

ORANGE: SM, Joe H. Brown, W6UBQ—ASMs: Riv Co-Joe, KO6XB 909-685-7441. Org Co-Art, W6XD 714-556-4396. SB Co-James, KE6LWU, 909-824- 2454. Sec News/ PIC-Gwyn, KE6JOF, 909-685-7441; SEC Dean, KG6YS 909-687-8878. First Words of Wisdom come from BPARC's pres, George Glanzmann, KF6BIV, who reiterates what most club board members want the membership to know: "Comments, help, opinions, help, ideas, help, hints, help and criticism (constructive) are always welcome. So let's hear from you." Another BPARC member, Art Enockson, W6EA, was honored by The Southern California DX Club. He was presented with a Lifetime Achievement Award on May 2 in Visalia. Congrats, Art! Second Words of Wisdom

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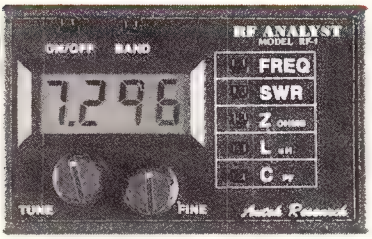

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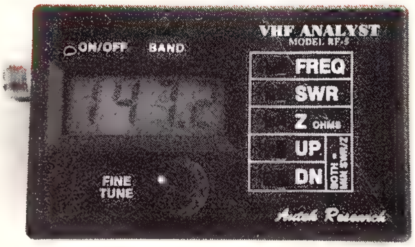

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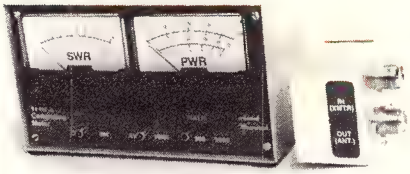

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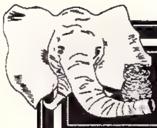

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New! CD-ROM version!

come from Lee DeForest ARC's member K C Jones, W6OB: "Help someone on the road to their license." And, LDFARC's David Kropp, N6PLV, wrote in their newsletter about their "May awards ceremony" where "Special Act Awards went to Walt Shirley, ... [their] representative on the Hemet Disaster Planning Commission," and other awards "were also presented to Jay Wheaton, Tabitha Meredyth, Bob Braitsch, Rod McHenry, Jim Cameron, Don Bronson, Doug Purkiss and Mark Thompson for their contributions to the RACES program during 1997." Good work. WARA has named Mike Johnson, AD6CC, as their Ambassador of the Month. Congrats, and keep up the good work in your Elmering. West Coast ARC and the Golden Triangle ARC have both been renewed as "Special Service Clubs". A pat on the back to your respective memberships. BCWS's N6YM wrote that he "heard W4UE, grid EM90 (Florida) working KF7UV (Nevada) on the 2-meter band direct. Congratulations to KF7UV and W4UE for breaking a 10 year old North American 2 meter Es distance record." Volunteers are needed to help man the Amateur Radio Information Booth, sponsored by OCCARO, at the Orange Co. Fair from Fri 7-10 thru Sun 7-26. If you are available, call Marcia, N6ISW, 714-775-6095, or Jane, KD6ODV 714-531-6707 to volunteer. Autonetics reports the 1997 board will serve again in 1998: Dan Violette, KI6X, pres/sec; Jim Heiertz, KN6BU, vp; and Bill Kirsanoff, KD6MCI, treas. Fine business. Don't forget to register early for the ARRL SW Div Conv to be held on Aug 14-16 at the Town & Country Convention Center Hotel Circle North — Highway 8, in San Diego. STM N6GIW reports for April '98: Traffic totals: KO6RZ 261, KC6SKK 96, N6GIW 69, W6QZ 38, N3IVO 14, KD6EYI 8, KA6TND 5. Digital traffic: W6QZ NTS BBS 116. N6GIW MAILBOX 322. PSHR: W6QZ 130, KO6RZ 119 KC6SKK 108. Net Mgr, KO6RZ, reported SCNV 31 Sess, QNI 279, QTC 115. Vy 73, KE6JOF and W6UBQ.

SAN DIEGO: SM, Tuck Miller, K6ZEC, 619-475-7333—ASM: Patrick Bunsold, WA6MHZ. ASM/Elmers: Pat Ryan, KC6VVT. ASM/MARS: Harry Hodges, WA6YOO, ASM/Youth: Frank Forrester, KI6YG; ASM/Red Cross: Al Rich, W6WYN. SEC: Dave Doan, KC6YSO. ACC: Evelyn Miller, KE6YXB. Bul Mgr: Steve Adams, K6PD. PIC: BJ Albright, KF6NQF. SGL: Bob Spann, KE6BJL. OOC/TC: Del Radant, N6JZE. STM: Warren Dilley, KT6A. DECs: North: Dennis K7DCG, South: Vacant, Imperial: Martin N6QU, East: Rich, N6NKJ, Central Wade, KE6BZI. Ham PANDA-monium! It is fast approaching, and yes, you still have time to get your preregistration in before the Aug 1 cutoff date. A representative from the International Space Station will be banquet speaker, and Dave Bell, W6AQ, will be our Master of Ceremonies. There will be manufacturers and dealers on various ham supplies and products. Many forums on various ham topics, including fast growing APRS. For a list of topics, visit the San Diego Section Web Page. On to club news, Abe Lincoln paid a visit to the Southbay Amateur Radio Society and brought a small glimpse of history. Ed Hare, W1RFI, will be guest speaker for the Amateur Radio Club of El Cajon on August 13. Ed is the League's RFI specialist. On a final note, I would like to wish my YL a happy birthday on August 17, where she tells me she will be 25. Hmmm. Tfc: KT6A 675, WA6ODQ 348, KD6YJB 301, K7DCG 76, KD6IVF 14, WA6IIK 3 BPL: KT6A 675 PSHR: KT6A 136, KD6YJB 88. Remember, Helping Others Always Worthwhile! 73, Tuck, K6ZEC.

SANTA BARBARA: SM, Rob Griffin, K6YR, SM & STM, 805-543-3346 & k6yr@arrl.org—SEC: Jennifer Roe, AA6MX. ACC: Michael Atmore, KE6DKU. BM: Howard Coleman,W6HQA. OOC: Tom Perkins, KD6BXM. PIC: Jeff Reinhardt, AA6JR. TC: Warren Glenn, KM6RZ. ASMs: Doc Gmelin,W6ZRJ & Don Milbury,W6YN. DECs: SB - Rick Laird, KB5OO; SLO – Jack Hunter, KD6HHG, Ven - Dave Gilmore, AA6MX. Support them! The League's Bylaws call for each division director to report annually to the members of the division. Few do, but one who presents a consistent Annual Report is our Director, Fried, WA6WZO. Fried works hard at keeping the Southwestern Division leadership and rank-in-file informed. But it takes active members to keep our leaders informed and engaged. So, it works both ways. Let's hear from you. In my swings around the section to club and special events supported by our Field Organization members, I hear criticism about the League's efforts on our behalf. I encourage constructive criticism, but more often than not, what I hear stems from a lack of facts, or misunderstanding. I follow closely the deliberations and actions of both the League's Board of Directors and its Executive Committee. In my opinion they have undertaken proactive and ambitious programs that will preserve and enhance the Amateur Radio Service. You don't have to agree with all they do, but they are working for YOU. Tfc/PSHR: K6YR 149/176, KE6MIW 38/114, W6ZRJ 44/-, KM6RZ 3/- & W6VL 6/-.30, Rob Griffin, K6YR, SM.

WEST GULF DIVISION

OKLAHOMA: SM, Coy Day, N5OK—ASMs: N6CL, K5CPZ, K5TTT. SEC: W5ZTN. STM: AB5RV. ACC: KB5BOB. PIC: WA9AFM. OOC: K5WG. SGL: W5NZS. TC: KB5RV. (http://www.telepath.com/n5ok/) Congrats to the Luther Youth ARC on their special event, May 9th, operating KB2AW to assist the Luther Historical Society in celebrating the town's 100th anniversary. Jim, KD6VPE, installed a Weather Voice system on the Owasso repeater. It uses .WAV files to provide spoken: temperature, wind speed and direction, dew point, barometric pressure and whether it is steady, rising or falling. The Tulsa Weather Service received thanks from the Latimer and Pittsburg County EM offices for the WA5LVT weather net using Tulsa ARC's UHF link system to keep them apprised of the severe weather in their area in April. Congrats to Frank, KC5PDX, who has run over 100 TARC Thursday night nets and now he has had over 100 check-ins on a single night. Mr. James Roberts, EM director, addressed the Pottawatomie County ARC, on areas where he could use assistance in an emergency. The Enid club had a recruiting drive on May 30 at the home of Dick, NJ5S, with great Mexican food. We will soon have another ROSE Switch (kf5rh-2, 580384) at Mill Creek on 145.01. The Kay Co ARC will sponsor an "Upgrade to General" class this summer and fall. Code practice will start this summer. The theory instruction will follow on successive Monday nights and will end with a special VE session to graduate our new General license ops! Those interested should contact KD5FX. Tfc: WB5NKC 494, N5IKN 450,

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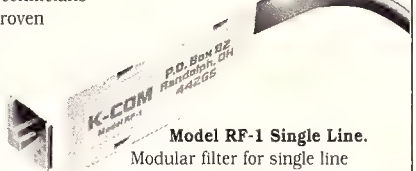

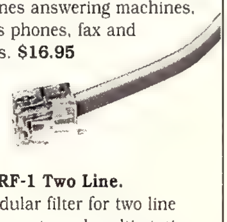

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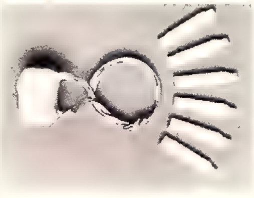

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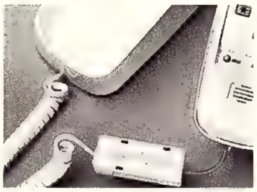

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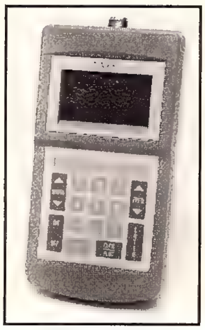

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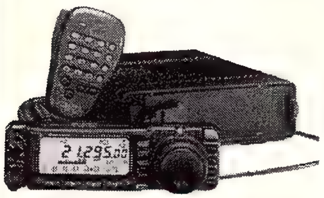
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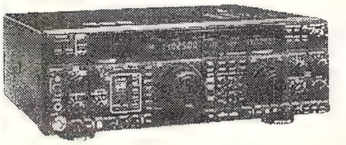

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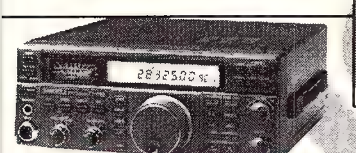

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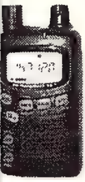

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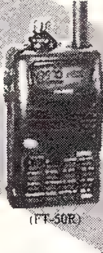
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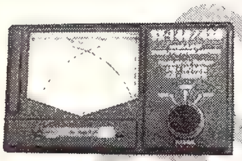

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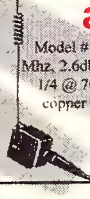

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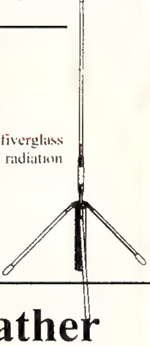

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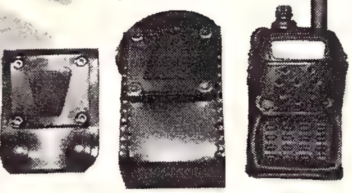

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SOUTH TEXAS: SM, E. Ray Taylor, N5NAV—ASMs: AE5ED ex KS5V, N5WSW, WD5GKH, K5DG, N5LYG, WA5UZB, KK5CA, WA5TUM, KB5AWM, WA5JYK, K5PFE, and K5SBU. STM: WD5GKH. SEC: K5DG. ACC: N5WSW. PIC: KA5WSS. OOC: AE5ED. TC: KJ5YN. BM: W5KLV. SGL: KM5HY. The Fulmore Middle School's Amateur Radio Club made contact with *Mir* Space station, and the media showed up in force. Media coverage by KLBJ-AM, KTBC, KVUE, and KXAN TV, Associated Press and Dallas Morning News. W5WIA submitted an article to ARRL for *QST.* Congratulations to all the Austin hams that assisted in this project to promote ham radio to the younger generation. There will be media training for the PIOs at Austin Summerfest August 1, by Martha Underwood, N2VRF, with real-world information about the Jarrell tornado and tips on media coverage. I do hope all PIOs will attend. On May 22, the third graders of Frazier Elementary School of New Braunfels, TX, met in Landa Park for Science Day in the field. Through the efforts of Todd, N5IJR, ham radio was introduced to all the kids. N5IJR set up packet in the Prime Co Emergency van and a packet station on a bench in the pavilion so the kids could talk by computer. I set up the Yaesu 1000MP from the van with the antenna mounted at the top of the 52 ft hydraulic mast that comes up from the center of the van. 102 third graders talked by voice to several hams in the US and Canada. I want to thank W5KBP, W5ZIN, K5IQZ, W5BMK, K5ROB, KD5CB, N0BAE, WA7DE, VE7KW, K9JPS, N4KNC, W9TND, K9JHK, WI7J, KT4SH/m, KF4WRX, and KG8CX for letting the kids talk to you. If I left anyone out, please forgive me. It was 98 degrees with a slight breeze. It was rough on this old man at 65 years old, but so enjoyable to see the kids' faces light up when they heard their name come back on the radio. This was a real delight in my life from 9 AM to 2 PM to work with these young ones. I'm sure Todd feels the same. Others that are retired might try this—you might like it. It's more exciting than Field Day. We have a new State Government Liaison, Clif Maloney, KM5HY. Clif and I worked together for many years with the Texas Division of Emergency Management. Thanks again Clif for joining the ARRL family in South Texas. I've seen real progress with our clubs by reading the newsletters I receive. I have received many complaints about the band plan issue. Please note that the ARRL request was, unfortunately, mishandled by the FCC and has caused some misunderstanding among the amateur community. See the article in July *QST*, p 71, for a clarification. This is no reason to drop your membership with ARRL. Remember, there is no organization that helps and supports the hams like the ARRL does. They fight for our frequencies, they supply a lawyer to help when an antenna ordinance stands in our way. This is just a small part of the things they do to help us. Without our support from the field, the ARRL could not function on our behalf. Let's get in there and help to make a difference. Help them out when we're needed. Please think real hard before you make your decision to drop out. You can't do anything on the outside. Thank you, South Texas, for allowing me to be your Section Manager. God Bless. Tfc: W5YQZ 683, KK5QT 400, N5NAV 210, AE5ED 153, WB5YDD 89, W4RRX 81, W5RZV 78, WD5GKH 45, KD5GM K5UCQ 42, W5ZX 41, W5FXQ 33, W5CTZ 28, W5TFB 28, W5KLV 27, WA5AA 18, N5LF 17, N5OUJ 15, WD5AAH 8, N5JUU 2, KG5CX 2.

WEST TEXAS: SM, Charlie Royall, WD5CJI, 915-944-0469 or cnroyall@wcc.net—Tnx to El Paso, Big Spring, Odessa, Midland, San Angelo, and WTX Connection for the newsletters. The editors are doing well in keeping the membership informed of FCC and ARRL actions. Of 17 clubs, only 6 are submitting newsletters. Congrats to new amateurs: Lubbock: Janice Furgerson, KD5EHU, Michael Furgerson, KD5EHW, Andrew Lawson, KD5EHV, San Angelo: Jeff Wiedenfield, KD5EJI. Upgrades: Lubbock: Shirley Dunn, KD5ADC, Advanced Way to go, Shirley! Public Service Awards: Lubbock: Roy Carson, KC5OGT; Josh Herring, KC5VKA; David Herring, KC5VKB; Jerry Russell, KC5MVT; Harell Ellis, KD5ADO; Jim Hicks, N7IND; Ron Daughtry, KC5TWV; Pat Hancock, KC5MWA; Randy Hobbs, KC5HNH; Big Spring: Lee Reed, KB5HNW; Ray Dunagan, WD5EFJ; J. L. Stevens, N5INC; Paul Johnson, KC5ALH; Irene LeMarr, N5JZM; Jim LeMarr, W5NBC; Chris Churchwell, KC5DFZ; Terry Rumpff, KC5TWR; Jerry Farmer, KK5EM; Jose Gonzales, KB5GXW. The MS Walk has been a big success. Tnxs to all! Traffic report DRN 5, May 526 messages, 62 sessions. WTX represented 53% by KF5NI, WA5PDK, K5RYT, W5KBP — reported by WB5YDD and relayed by WA5PDK. 73' 'til next month.

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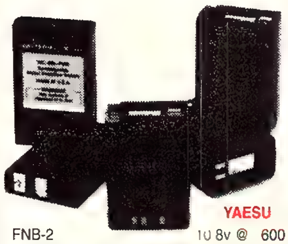

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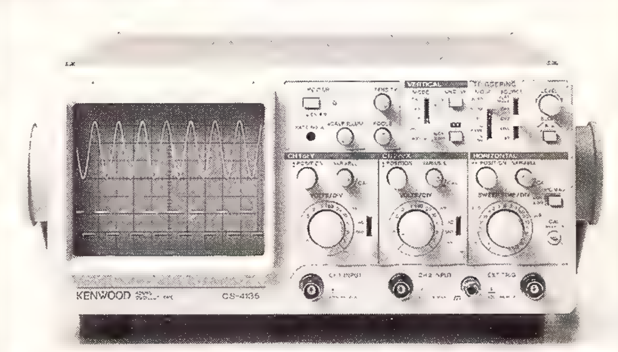

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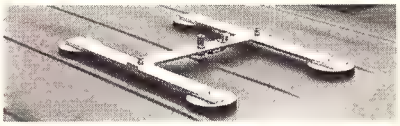

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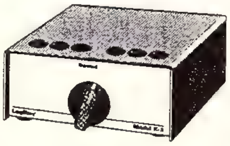

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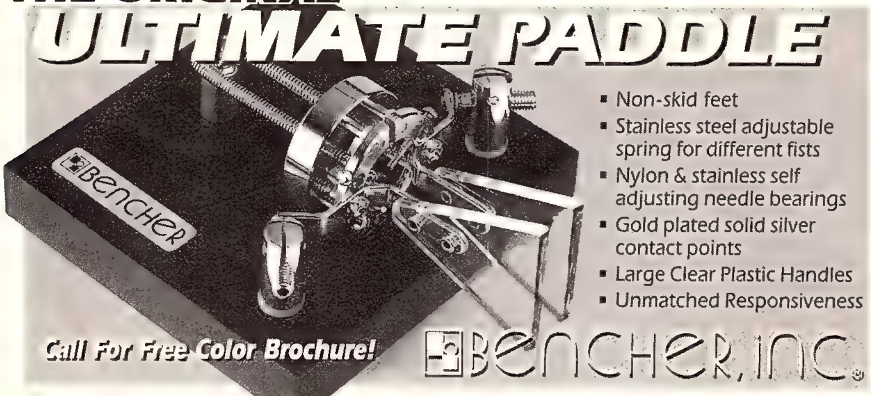

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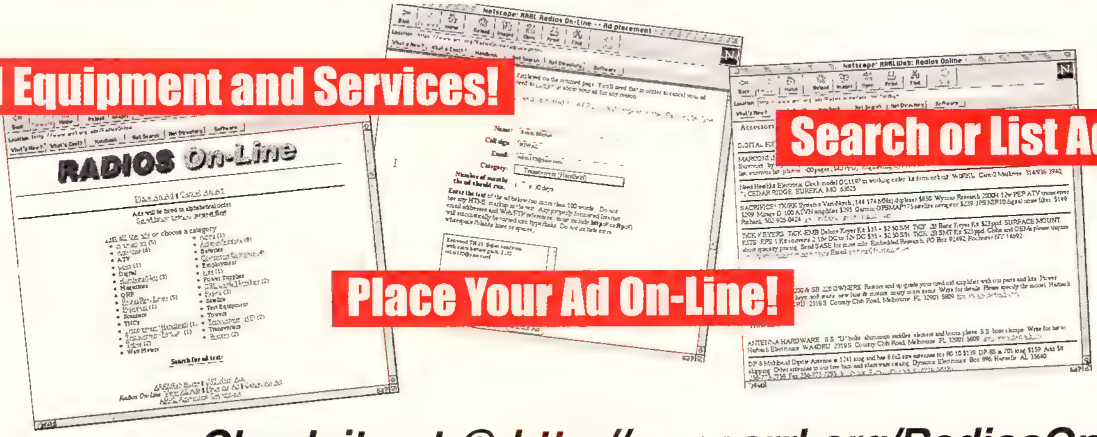

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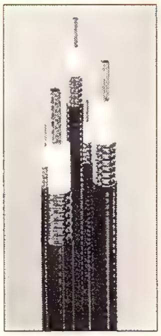

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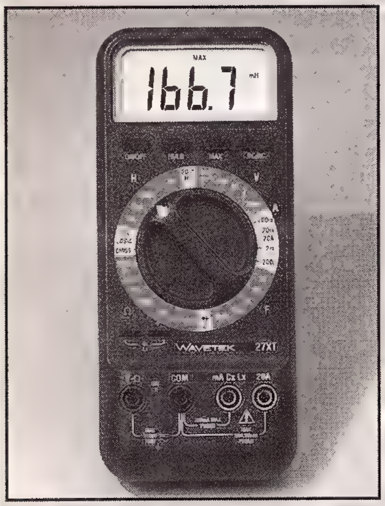

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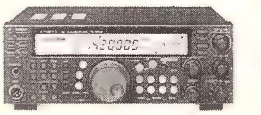

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RG58A/U STRD CENTER 95% TC BRD UV RESISTANT JKT 2.6dB/350 WATTS @ 30MHz	.17/FT	.15/FT	.13/FT
RG217/U SOLID BC 2 95% BC BRD NC/DB/UV JKT .70dB/4000WATTS @ 30MHz	1.10/FT	1.00/FT	.95/FT

COAX (50 OHM *Teflon*® GROUP)

RG142/U SOLID SCCS 2-95% SILVER BRAIDS *Teflon*® JKT 8.2dB/1100WATTS @ 400MHz......25FT/UP 1.25/FT

RG303/U SOLID SCCS 1-95% SILVER BRAID *Teflon*® JKT 8.6dB/1100WATTS @ 400MHz........25FT/UP 1.00/FT

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RG11/U SOLID BC (VP-78%) 95% BRAID NC/DB/UV JKT 1.1dB/800WATTS... .40/**100FT/UP**........38/**500FT**..........36/**1000FT**

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1618 8/COND (2/16 6/18) BLK UV RES JKT. Recommended up to 200ft	.35/FT	.34/FT	.32/FT
1418 8/COND (2/14 6/18) BLK UV RES JKT. Recommended up to 300ft	.47/FT	45/FT	43/FT
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2206 22GA STRD 6/COND PVC JACKET	.18/FT	.16/FT	.14/FT
1806 18GA STRD 6/COND PVC JACKET	.23/FT	.21/FT	.19/FT

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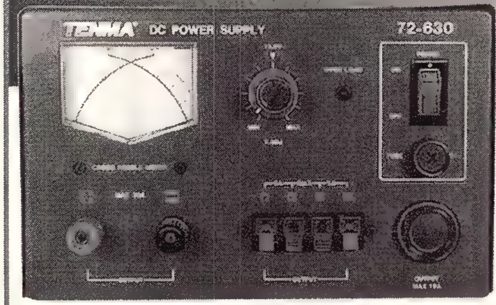

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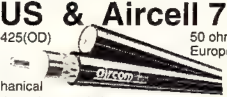

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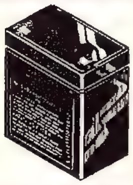

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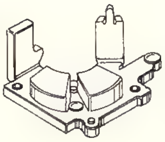

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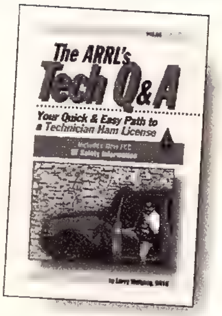

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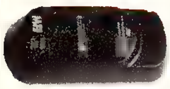
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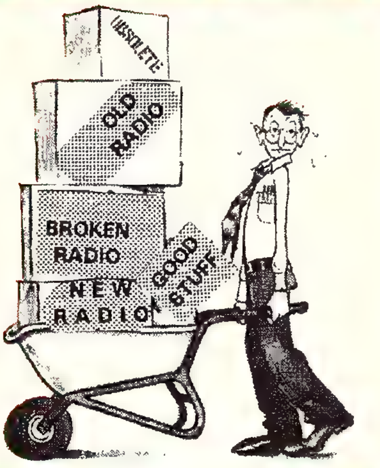

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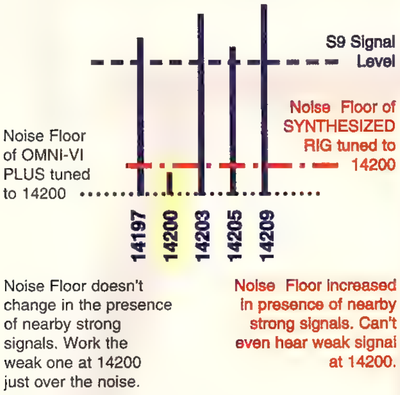

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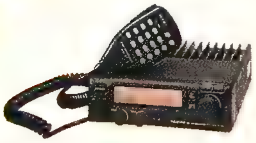

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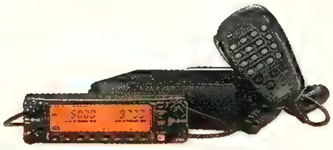

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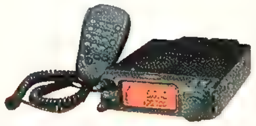

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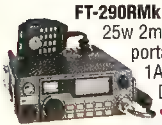

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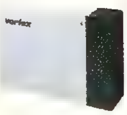

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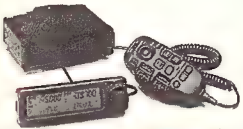

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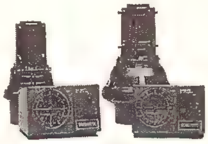

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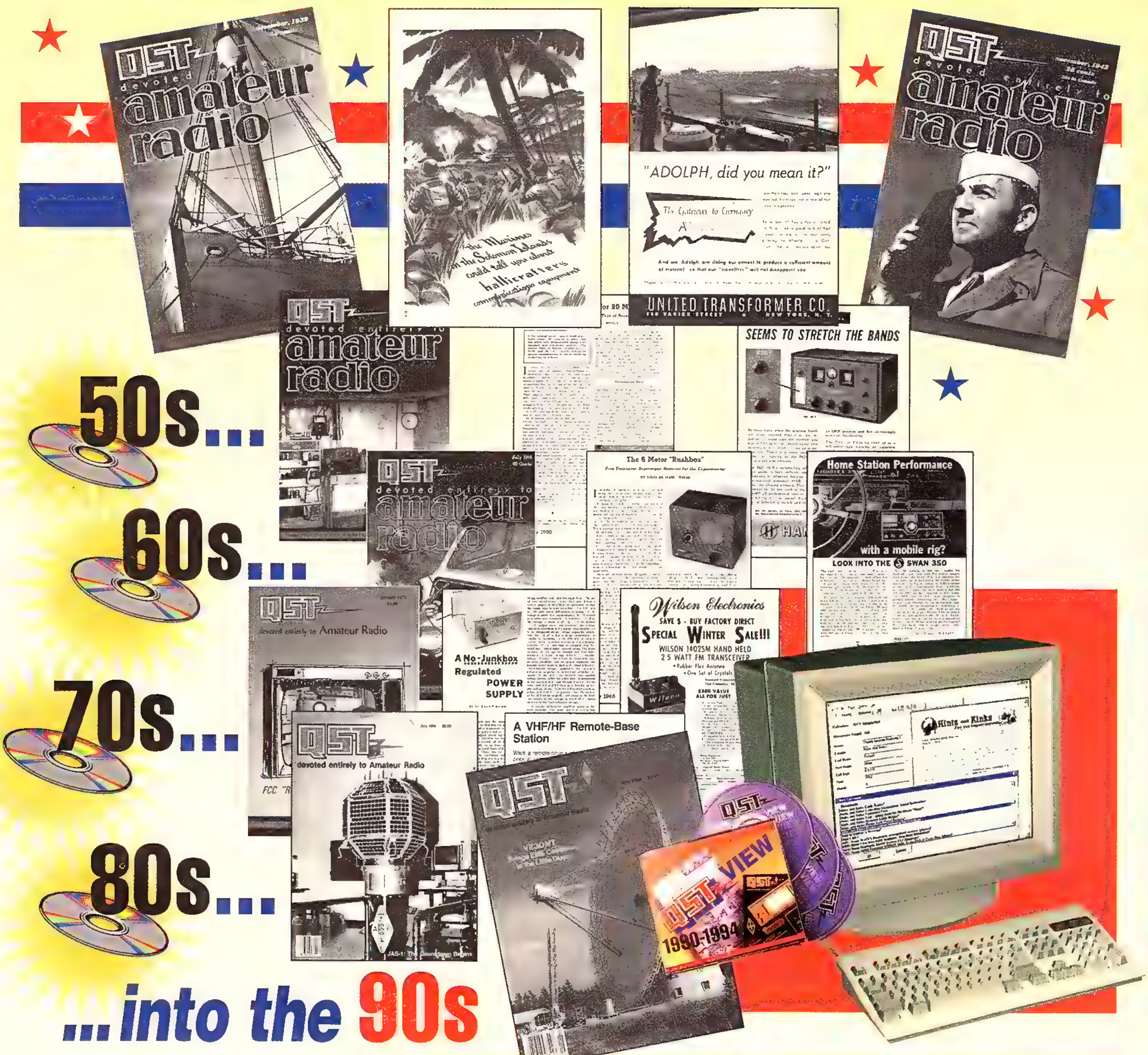
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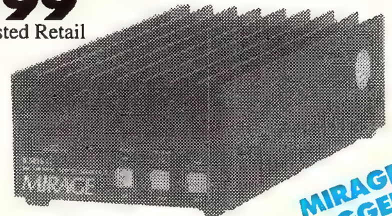

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Watts In	20	25	30	35	40	45	50	55

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B-310-G
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Power Curve -- typical B-310-G output power							
Watts Out	25	50	75	95	100	100+	100+
Watts In	¼	½	1	2	4	6	8

- *100 Watts out with all handhelds up to 8 watts*
- *All modes: FM, SSB, CW*
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Power Curve -- typical B-34-G output power								
Watts Out	18	30	33	35+	35+	35+	35+	35+
Watts In	1	2	3	4	5	6	7	8

- *35 Watts Output on 2 Meters*
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- *Auto RF sense T/R switch*
- *Custom heatsink, runs cool*
- *Works with handhelds up to 8 watts*
- *One year MIRAGE warranty*

MIRAGE RUGGED!

35 watts, FM only . . . $69.95

B-34, $69.95. 35 watts out for 2 watts in. Like B-34-G, FM only, less preamp, mobile bracket. 3⅛x1¾x4¼ inches.

MIRAGE Dual Band 144/440 MHz Amp

BD-35
$159⁹⁵
Suggested Retail

MIRAGE RUGGED!

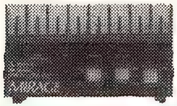
Power Curve -- typical BD-35 output power							
Watts Out (2Meters)	30	40	45	45+	45+	45+	45+
Watts Out (440 MHz)	16	26	32	35+	35+	35+	35+
Watts In	1	2	3	4	5	6	7

- *45 Watts on 2 Meters/35W on 440 MHz*
- *Auto Band Selection* • *Auto T/R switch*
- *Full Duplex Operation* • *5x1¾x5 inches*
- *FREE mobile bracket* • *"On Air" LEDs*
- *Single Connector for dual band radios and antennas*
- *Reverse polarity protection*
- *Works with all FM handhelds to 7 watts*
- *One year MIRAGE warranty*

Add this Mirage *dual band* amp and boost your handheld to a *powerful* mobile or base -- 45 watts on 2 Meters or 35 watts on 440 MHz! **Mirage's** exclusive *FullDuplexAmp*™ lets you talk on one band and listen on the other band at the same time -- *just like a telephone conversation.* (Requires compatible HT).

6 Meter Amplifier

FCC Type Accepted



The A-1015-G, $389, is the *world's most popular* all mode FM/SSB/CW 6 Meter amplifier. 150 watts out for 10 in. For 1 to 15 watt transceivers.

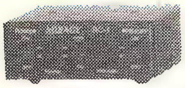
70cm Amplifiers (420-450 MHz)

D-3010-N, $365, -- 100 W out/30 in. For 5 to 45 watt *mobile/base*. **D-1010-N, $395**, 100 W out/10 in. *Dual purpose* -- for handhelds or mobile/base. **D-26-N, $269**, 60 W out/2 in, for *handhelds*.

Amateur TV Amps

Industry standard ATV amps -- **D-1010-ATVN, $414**, 82 watts PEP out / 10 in. **D-100-ATVN, $414**, 82 watts PEP out/2 in. (without sync compression).

Remote Control Head for Amps

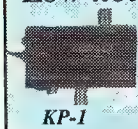


RC-1, $45, remote controls most MIRAGE amps. Power On/Off, preamp On/Off, switch for SSB/FM. 18 foot cable (longer available). 1¾x3¾x2½ inches.

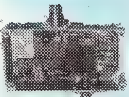
Repeater Amps

11 models -- continuous duty all modeFM/SSB/CW repeater amps for 6, 2, 1 1/4 Meters, 70cm, 450 MHz ATV.

Low noise GaAsFET preamps



KP-1



KP-2

High gain *ultra low noise* GaAsFET preamps for receiving weak signals. Selectable gain prevents receiver intermod. 15 to 22 dB gain. Less than 0.8 dB noise figure. Automatic RF switching up to 160 Watts. **Choose** In-*Shack* model or *Mast-Mount* (includes remote control) model to reduce loss. Rugged die-cast enclosure.

Frequency (MHz)	*In Shack* $139	*Mast Mount* $195
28-30	KP-1/10M	KP-2/10M
50-54	KP-1/6M	KP-2/6M
144-148	KP-1/2M	KP-2/2M
220-225	KP-1/220	KP-2/220
430-450	KP-1/440	KP-2/440

1¼ Meter Amps (223-225 MHz)

Choose from 10 models -- 20 to 220 watts out for 2 to 50 watts in, $129 to $655.

Commercial Amps ($199 to $395)

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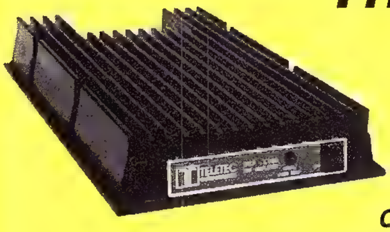

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DXP-V175	2 meter	50W/175W	$329.00
DXP-V220	220 MHz	20W/150W	$369.00
DXP-U150	70 cm	30W/150W	$429.00

Model # R=Rack D=Desktop	Freq.	Pwr Rating (In/Out) *	Sugg. Retail
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DXR-V175_	2 meter	50W/175W	$629.00
DXR-V220_	220 MHz	20W/150W	$659.00
DXR-U150_	70 cm	30W/150W	$789.00

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DJ-C1T
DJ-C4T
DJ-C5T

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DJ-G5TH	5w 2m/440 FM HT/cgr	©	319^{95}
DJ-S11T	340mw 2m HT/AA batt hdr	Special	88^{95}
DJ-S41T	340mw 440 HT/AA batt holder	Special	88^{95}
DJ-X10T	.1MHz-2GHz AM/FM/SSB/rcvr/cell blked		399^{95}
DJ-191TH	5w 2m FM HT/batt/cgr/TTP	©	189^{95}
DJ-280TH	5w 220 FM HT		219^{95}

***DJ-C1T/DJ-C4T** no internal speaker, must use earphone

FAMILY RADIO SERVICE

Model	Description	Price
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MOBILES

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DR-150TQ	50w 2m FM w/CTCSS decoder		279^{95}
DR-430TQ	440 FM xcvr w/CTCSS decoder	©	259^{95}
DR-605TQ	50w 2m/35w 440w/ctcss dec	©	399^{95}
DR-610TQ	50w 2m/35w 440w/ctcss dec	©	499^{95}
DR-M06TH	20w 6m FM xcvr/TTP mic	Special ©	249^{95}

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DX-70TH	Compact HF/100w 6m xcvr	©	899^{95}
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DR-150TQ

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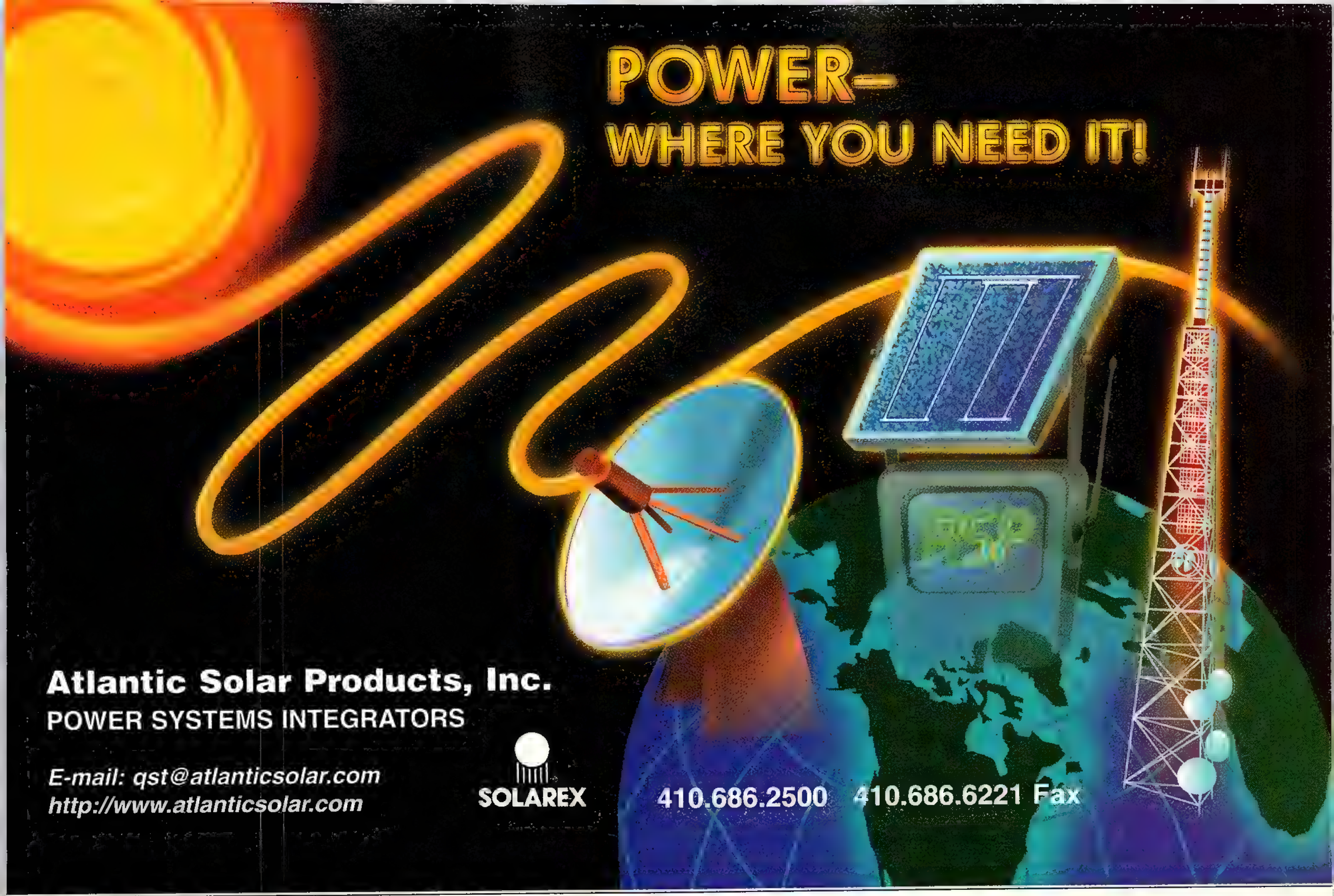

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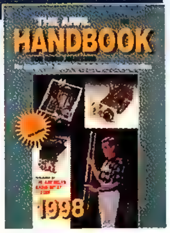

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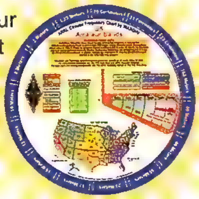

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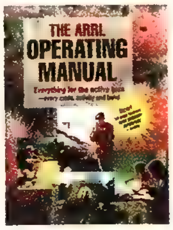

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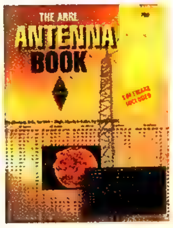

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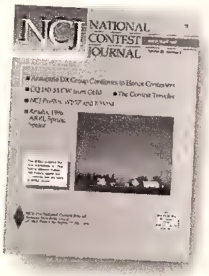

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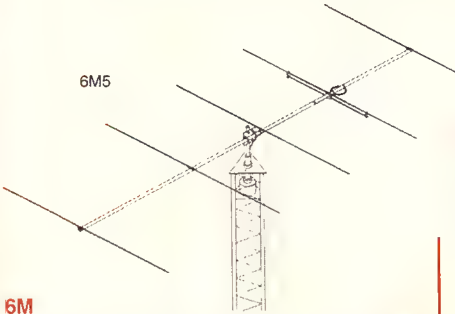

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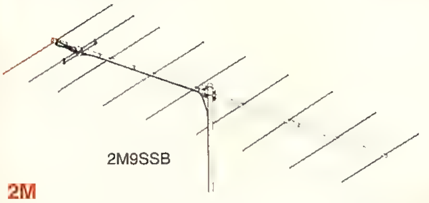

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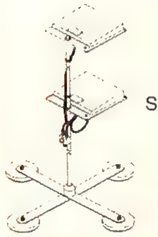

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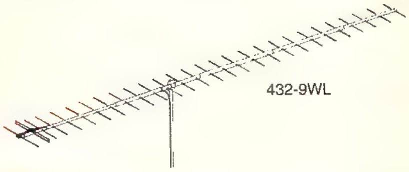

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A & A Engineering: 128
ADI Communications: 13
Advanced Receiver Research: 118
AEA division of TEMPO RESEARCH CORP: 146
Al Buxton, W8NX: 122
Alinco Electronics, Inc.: 11
All Electronics Corp.: 155
Alpha Delta Communications: 8
Alpha/Power, Inc: 129
Alternative Arts: 126
Amateur Electronic Supply: 131, 143, 163, 167
American Radio Relay League: 7, 22, 23, 138, 151, 154, 157, 164, 166, 168, 173
Ameritron: 14
Andrew Corp - CABLE X-PERTS: 151
Antique Radio Classified: 126
Arcron - Zeit: 114
ARRL Publications Bookcase: 171, 172
ARRL Training Videos: 170
Associated Radio Communications: 124
Atlantic Solar Products, Inc: 169
Austin Amateur Radio Supply: 135
Autek Research: 145
Bencher Inc: 150
Bilal Company: 150
BOXBORO Hamfest: 152
Brian Beezley K6STI: 168
Buckmaster Publishing: 130, 168
Buffalo Hamfest: 168
Burghardt Amateur Supply, Inc: 148
Butternut Antennas: 140
C & S Sales, Inc: 156
CABLE X-PERTS: 151, 153
Chicago FM Club: 158
Code Quick: 155
Comm-Pute Inc: 148
Communication Concepts, Inc.: 142
Communications Specialists Inc: 124
Connect Systems Inc: 149
Cubex Company Inc: 162
DATAMATRIX: 152
Davis Instruments: 122
Davis RF Co.: 128
DCI Digital Communications, Inc.: 144
Denver Amateur Radio Supply: 120
Electro Communications Systems: 128
EM Scientific, Inc: 157
EMTECH: 126
Fair Radio Sales Co Inc: 156
Gap Antenna Products Inc.: 133
Gladiator Verticals/R. Myers Communications: 145
Glen Martin Engineering: 142
Ham Contact: 130, 138
Ham Radio Outlet: 108, 109, 110, 111, 112
Ham Station: 169
Hamfesters Radio Club: 168
Hamsure: 158
Hamtronics, NY: 26
High Frequency Technology, Inc.: 120
High Sierra Antennas: 156
Hi-Res Communications, Inc.: 126, 154
Home Automation Systems Inc.: 155
ICOM America, Inc.: Cover II, 1
Idiom Press: 150
IIX Equipment Ltd: 126, 162
International Antenna Corp: 138
International Components Corp.: 140
JC Software: 128
Jun's Electronics: 127
K2AW's "Silicon Alley": 158
Kachina Communications Inc.: 137
Kawa Productions And Records: 162
K-Com: 146
Kenwood USA Corp.: Cover IV
Lakeview Company, Inc: 116
LDG Electronics: 116
Lentini Communications: 135
Lewallen Roy W., W7EL: 158
Logic: 145
M & S Computer Products Inc: 122
Maha Communications & Electronics, Inc.: 2, 3
MCM Electronics: 153
Memphis Amateur Electronics: 152
Metal & Cable Corp.: 150
MFJ Enterprises: 113, 115, 117, 119, 121, 123, 125, 159
Micro Computer Concepts: 124
Micro Control Specialties: 116
Mirage: 165
Motron Electronics: 144
Mr. NiCd: 174
NCG Companies: 141
OB Communications: 155
ONV Safety Belt Co: 154
PC Electronics: 122
Peet Brothers: 130
Periphex Inc.: 118
Personal Database Applications: 145
Phillips-Tech Electronics: 162
Premier Communications: 13
Print Products International: 149, 151
PROLOG: 152
QSLs by K2QFL: 162
QSLs by W4MPY: 146
QSLs by WX9X: 154
Quantics: 146
R & L Electronics: 147
Radio Book Store: 146
Radio City: 135
Radio Club Of J.H.S. 22 NYC: 160
Radio Works: 157
Rapidan Data Systems: 148
Rederring Embroidery: 136
RF Inquiry Co Ltd: 132
Rohn: 132
Ross Distributing Co.: 144
RT Systems: 139
Shreveport ARA: 145
Sommer-Antennas: 148
Spider Antennas: 128
Spi-Ro Mfg. Inc.: 160
SSB Electronics: 154
Standard Amateur Radio Products: 27
Surplus Sales of Nebraska: 114
Svetlana Electron Devices: 150
Teletec Corp: 167
Tennadyne Corp: 120
Ten-Tec Inc: 134, 161
Terry Mayhan, K7SZL: 162
Texas Towers: 173, 175, 176
Tigertronics: 142
TJ Antenna: 148
Tower * Jack: 126
Traffie Technology: 152
Tri-Ex Tower Corp: 144
Universal Radio, Inc: 135
US Tower: 136
Vectronics: 6
Vi-Con International, Inc: 138
Virginia Beach Hamfest & Computer Fair: 148
W & W Associates: 149
W5YI Group Inc.: 126, 140, 158
W9INN Antennas: 122
Warren Gregoire & Associates: 144
Wheeler Applied Research Lab: 155
Wireman, Inc.: 155
Wm. M. Nye Co., Inc.: 126
Yaesu U.S.A.: Cover III, 17, 18
Yost & Co., E.H.: 174

-775DSP .... New Lower Price!

00 Watts • Digital Notch • Digital CW Filter
igital Noise Reduction • True Dual Receive
uto Antenna Tuner • Twin Pass Band Tuning

OMPETITION CLASS HF PERFORMER

-821H .... Please Call!

m / 70cm All Mode • 45 / 35 Watts • IF Shift
600 Baud Mode • 160 Memories • RIT
CXO Option • Multiple Scan • More!

NEW LOWER PRICE!

ICOM DEALS!

Texas Towers has ICOM specials galore! In addition to our every day low prices, ICOM has recently introduced coupons and free mail-in offers on most models shown in this ad. So be sure to give us a call–Texas Towers really does sell for less!

Please call for our free catalog, or visit our website at www.texastowers.com!

IC-746 .... Now In Stock!

- HF + 6m + 2m • 100 Watts Out • IF-DSP!
- Twin PBT • Large LCD Display
- Auto Tuner • PC Interface • Much More!

AFFORDABLE PRICE - PLEASE CALL!

IC-706/MK-II .... Now in Stock!

- HF–2m All Mode • 102 Memories • CW Keyer
- Removable Display • Spectrum Scope • Scan
- Dot Matrix Display • Tiny: 7"x3"x8" • More!

PLUS $100 OFF COUPON

-2710H .... New, Low Price!

m/70cm Mobile • 220 Memories • Scanning
etachable Face • CTCSS Encode • Dual RX
ual In-Band RX • Duplexer • Much More!
excellent dual band FM XCVR, offering sepa-
e VHF / UHF controls and a backlit DTMF Mic.

CALL FOR SPECIAL PRICE!

IC-207H, New 2m/70cm Dual Bander . Call!

• Compact Size • 182 Memories • Scanning • Built-in Duplexer • CTCSS Encode • 50/35 Watts • CTCSS Scan • CTCSS Decode • 9600 bps A great dual band FM XCVR at a great price, remote mounting option, supplied with a DTMF hand mic.

NEW LOWER PRICE!

IC-2100H, NEW 2M Mobile XCVR .... Call!

- 55 Watts Out • 113 Memories • AM RX
- Mil Spec 810 • Large Dual Display
- CTCSS Encode • DTMF REMOTE Mic

CALL FOR SPECIAL PRICE!

IC-T22A .... Please Call

- 2m FM Handie Talkie
- Tiny: 2.3"W x 4.5"H x 1.1"D
- Extended Receive (136–174 MHz)
- 40 Memory Channels
- Alphanumeric Memory Names
- CTCSS Tone Encode
- EEPROM Memory Backup
- DTMF Paging Function
- Five DTMF Memories (30-digit)
- Multiple Scanning Modes
- Supplied with a Rechargeable NiCad Battery Pack, Plug-in Wall Charger, Belt Clip, and a Rubber Duck Antenna.

AFFORDABLE 2M HANDIE TALKIE!

IC-W32A ..... NEW, Low Price!

- 2m/70cm FM Handie Talkie
- Compact: 2.3"W x 5.5"H x 1.3"D
- 200 Memory Channels
- Independent Band Controls
- CTCSS Tone Encode
- CTCSS Tone Decode
- Dual In-Band Receive
- Extended Receive (118–174 MHz)
- Backlit LCD & Keypad
- Crossband Duplex
- Multiple Scanning Modes
- Supplied with a NiCad Battery Pack, Wall Charger, Belt Clip, and a Rubber Duck Antenna.

CALL FOR SPECIAL PRICE!

IC-T7A .... NEW, High Power!

- 2m/70cm FM Handie Talkie
- Compact: 2.3"W x 5"H x 1.1"D
- CTCSS Tone Encode
- CTCSS Tone Decode
- CTCSS Tone Scan Function
- Extended RX (118–174 MHz)
- AM Receive (118–136 MHz)
- 70 Memory Channels
- DTMF Paging & Squelch Option
- Multiple Scanning Modes
- Optional Programming Software
- Supplied with NiCad Battery Pack, Wall Charger, Belt Clip, Rubber Duck, and More!

CALL FOR SPECIAL PRICE!

ration offers are direct from ICOM. Coupons are subtracted at the time of sale. All offers expire September 30, 1998. All specs are subject to change.

HUGE ICOM DEALS!

VISIT US ON THE WEB! http://www.texastowers.com

CALL TOLL FREE **(800) 272-3467**

e.mail: sales@texastowers.com Internet: http://www.texastowers.com

TECH LINE **(972) 422-7306** FAX LINE **(972) 881-0776**

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9AM–5PM

SATURDAYS:
9AM–1PM

M/C•VISA
DISCOVER

HUGE YAESU DEALS!

VISIT US ON THE WEB! http://www.TexasTowers.com

YAESU DEALS

FT-1000MP* ..... Please Call For Special!
FT-1000D / FT-1000 .... Please Call!

***PLUS $100 OFF YAESU COUPON!**

FT-847 .... Now In Stock, Call!
- 160–10m/6m/2m/70cm All Mode XCVR
- DSP
- Satellite Ready
- Optional External Auto Tuner

HF, 6M, 2M & 70CM ALL MODE XCVR!

FT-8500, 2m/70cm Mobile ... HUGE SPECIAL!
FT-8100*, NEW 2m/70cm Mobile .... Call!

NEW LOW PRICE!

Texas Towers has Yaesu specials galore! In addition to our every day low prices, Yaesu is offering additional savings coupons for several of the radios shown on this page. So be sure to give us a call – Texas Towers really does sell for less!

G-2800SDX: Features 34 sq. ft. capacity, 450° rotation, preset control, and more!

G-2800SDX (34 sq. ft.)* ..... Call for price!
G-1000SDX (23.5 sq ft.* ..... Call for price!
G-800S / SDX (17 sq. ft.)* ...... Please Call!
G-450XL (11 sq. ft.) .... Please Call!
G-5400B Az/Elevation* .... Please Call!
G-500 Elevation Rotor* ...... Call for price!

***PLUS $25 OFF YAESU COUPON!**

FT-920 .... Call For Pric
- 160–6m XCVR
- 100 W Output
- D
- Auto Tuner
- FM Option
- CW Ke

PLUS $100 OFF YAESU COUPON!

FT-840 .... Call For Yaesu Speci
- 160–10m XCVR
- 100 W Output
- FM Opt
- Compact Size
- LCD Display
- Much M

AFFORDABLE HF TRANSCEIVER!

FT-2500* 2m Mobile XCVR C
FT-3000 2M Mobile XCVR, 70W C

NEW LOW PRICE!

VX-1R .... Call!
- Super Compact 2m/70cm FM HT
- 290 Memory Channels
- Alpha Numeric Display
- AM Receive (.5–1.7 MHz)
- Autodial Memory (10 Channels)
- CTCSS Tone Encode/Decode/Scan
- AM/FM/FM Wide RX Modes
- DTS Paging & Squelch
- Yaesu's ARTS System
- DTMF Memory
- Extended RX (76–999 MHz) Cellular Blocked
- Supplied with FNB-52 Li-Ion Battery Pack, Two-Hour Plug-In Wall Charger, Belt Clip, Rubber Duck Antenna, and More!

TINY 2M / 70CM DUAL BAND HT!

FT-50RD .... Please Call!
- Compact 2m/70cm HT
- Built to Mil. Spec. MIL-STD 810
- 112 Memory Channels
- CTCSS Tone Encode
- CTCSS Tone Decode
- DTMF Paging
- DTMF Squelch
- Dual Watch
- Extended RX 76–200 MHz
  300–540 MHz
  590–999 MHz
  (Cellular Blocked)
- Optional ADMS-1D Software
- Supplied with NiCad Battery Pack, Wall Charger, Belt Clip, Rubber Duck Antenna, and More!

PLUS $20 OFF YAESU COUPON!

FT-51RH .... Ca
- Tiny 2m and 70cm FM HT
- 120 Memory Channels
- Alpha Numeric Display
- AM Receive (110–138 MHz)
- Autodial Memory (10 Channels
- CTCSS Tone Encode
- CTCSS Tone Decode
- CTCSS Scan (Finds Tone)
- DTMF Paging & Squelch
- 5 Watts RF Output
- Direct Keypad Frequency Entr
- Extended RX (110–180 MHz)
- Extended RX (420–470 MHz)
- Supplied with FNB-31 NiCad Battery, Charger, Belt Clip, Rubber Duck, and More!

FREE MH-29 REMOTE SPEAKER MIC!

Prices, specifications, and stock quantities are subject to change without notice or obligation. Yaesu coupons expire August 31, 1998.

CALL TOLL FREE **(800) 272-3467**

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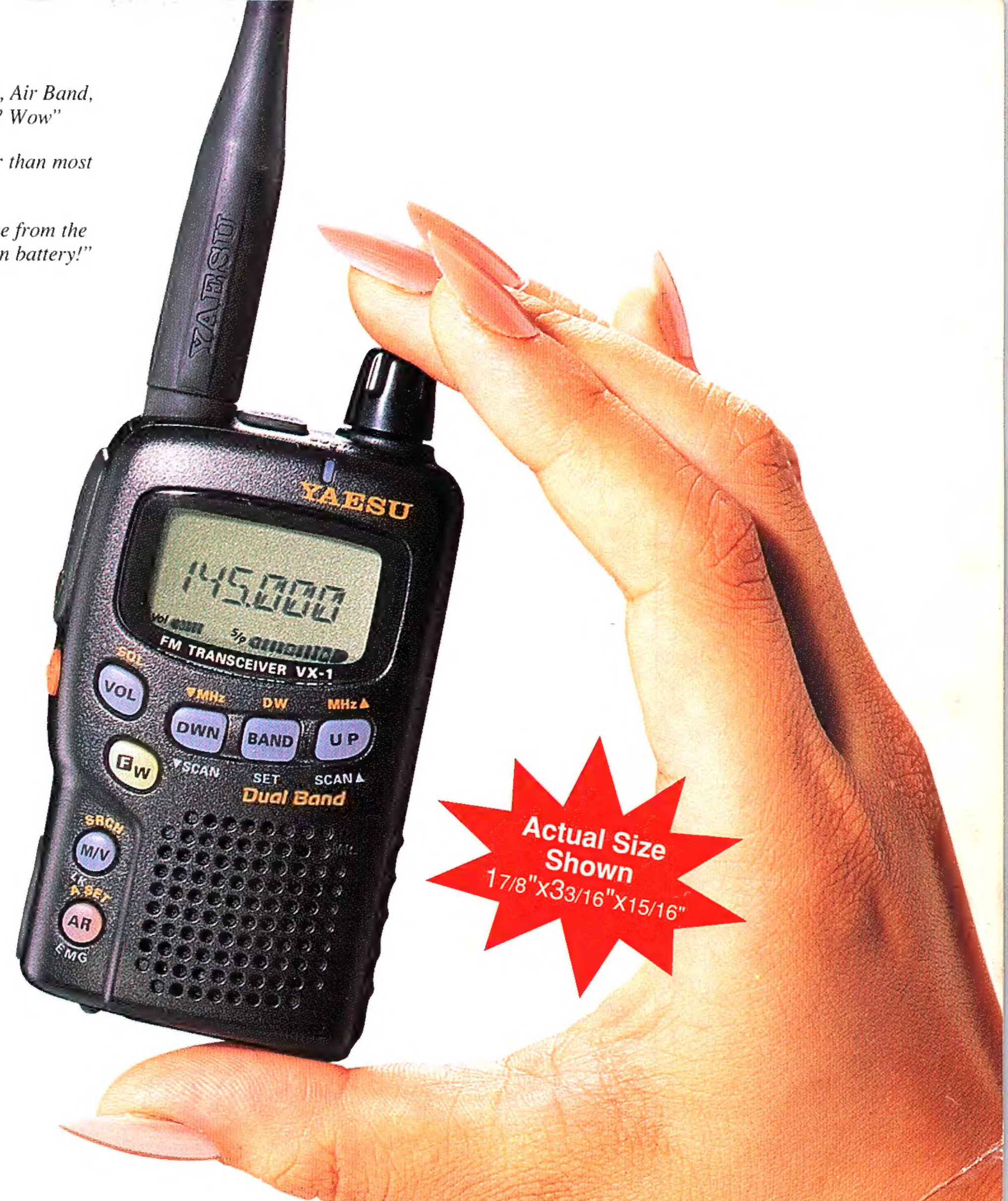
"VHF, UHF, AM, FM, Air Band, Police, Fire--TV" too? Wow"

"The VX-1R is smaller than most pagers!"

"Over 19 hours of use from the rechargable lithium ion battery!"*

"Looks like Yaesu did it again!"



VX-1R

Ultra-Compact Dual-Band Handheld

Features

- Frequency Coverage Wide Multi-Band Receive RX: 76~999 MHz** TX:144~148, 430~450 MHz
- AM/FM/TV Broadcast Receive
- AM Aircraft/Public Safety Receive
- CTCSS Encode/Decode
- DCS Encode/Decode
- CTCSS/DCS Tone Search
- Dual Watch
- SmartSearch™
- Auto Range Transpond System™ (ARTS™)
- Priority Channel Alarm
- ADMS-1D Windows™ Programmable
- 1 Watt External Power Supply
- 80 Minute Rapid Charger
- Flexible Antenna, Belt Clip, Hand Strap

***Cellular blocked*

**Battery Life: 5-5-90 duty cycle.*

The world's smallest HT with all the high-tech features Dick Tracy could ever want!

The ultra-compact size of the VX-1R Dual-Band is the first thing you notice as you cradle it in your palm. But the high-tech features make this radio one you must have now! Simple combinations, using seven buttons and one knob, control this marvel of engineering. One soft key touch, and wide receive VHF/ UHF--76~999 MHz RX (except celllar); 144~148, 430~450 MHz TX, or AM/FM Broadcast, Aircraft, Police, Fire--even TV, spring to life! Touch again for Yaesu-exclusives, SmartSearch™ and ARTS™, or Priority Channel Alarm. Built-in CTCSS and DCS Encode/Decode for 2m/440 amateur bands, CTCSS/DCS Tone Search, and Dual Watch, are included along with 291 Memory Channels in 9 banks with 500 mW power output. Backlit LCD Display shows 6-character alphanumeric capability; backlit keypad makes operation easy in dim light. And, although the VX-1R is the world's smallest† dual-band HT, you get over 19 hours* of use with just a 1 hour recharge from its long-lasting lithium ion battery! Big features, small size--the most satisfying combination in the world! See it at your Yaesu dealer today!

FT-50RD
MIL-SPEC,Heavy Duty, Dual-Band Handheld

FT-51R
Dual-Band with Dual Receive and Help Menu Function

YAESU

...leading the way SM

For the latest Yaesu news; hottest products, visit us on the Internet! http://www.yaesu.com

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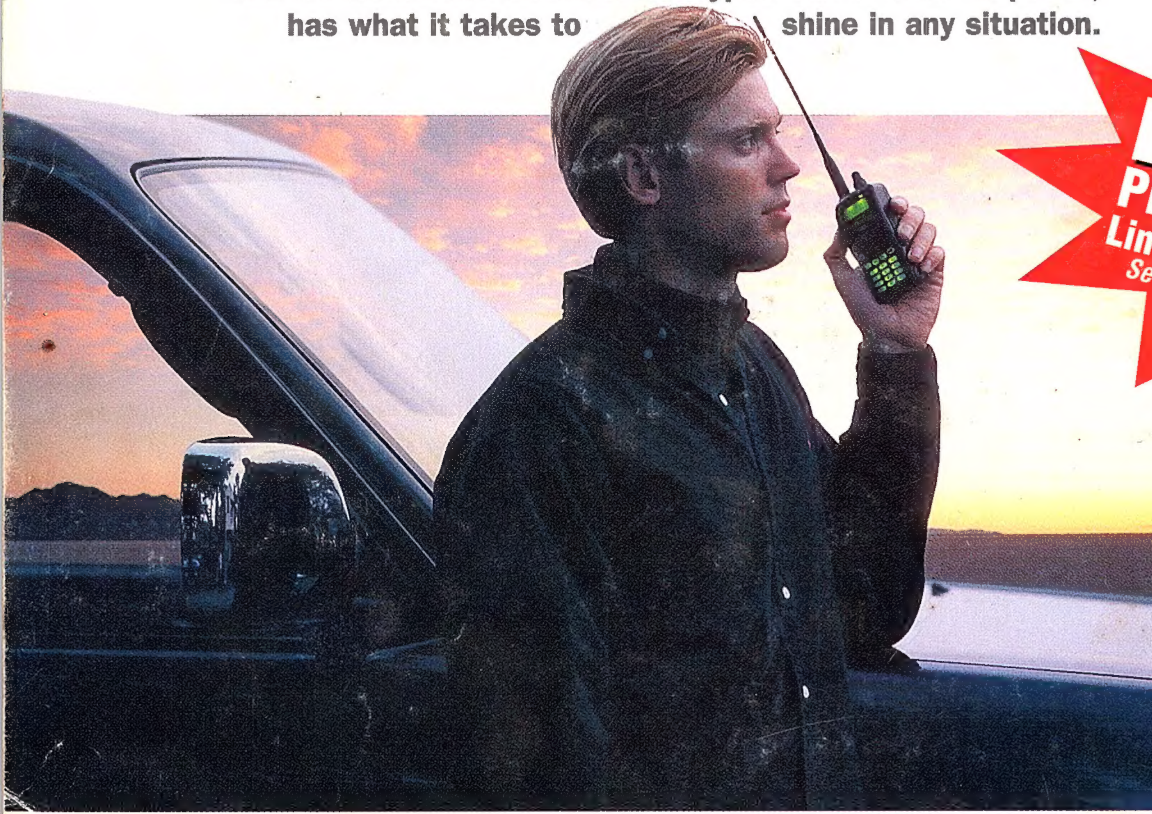
Specifications subject to change without notice. Specifications guaranteed only within amateur bands. So me accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

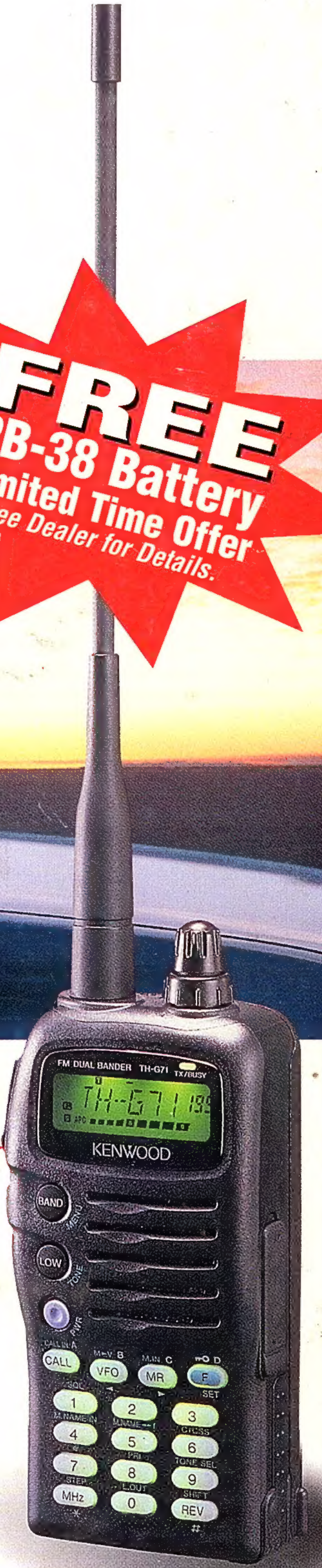
†Smallest HT as of Jan. 1998

Look on the brighter side of handhelds

Kenwood's new TH-G71A dual-bander (144MHz/440MHz), with its distinctive illuminated keypad and 6 watts of power, has what it takes to shine in any situation.



FREE
PB-38 Battery
Limited Time Offer
See Dealer for Details.



TH-G71A 144/440/MHz FM DUAL BANDER

If you're looking for a compact dual-bander with all the right features, yet without the price tag that usually goes with high performance, there's no better choice than the TH-G71A.

Just hold it in your hand and it's immediately clear how well our new handheld transceiver is engineered. The ergonomic design, **illuminated keys** and **backlit display** all combine to make operation a breeze. As does the menu mode, which allows you to customize the TH-G71A by adjusting all major settings to your choice. Besides being easy to use, it also boasts extraordinary power – up to 6 watts (VHF) or 5.5 watts (UHF) of RF output (selectable) with its **high-performance antenna.** The speaker provides **powerful, refreshingly clear audio.**

Of course, power is only part of the picture. Features count. And you can count on the TH-G71A to offer what you'd only expect to find in far more expensive HTs. There are **200 memory channels** – allowing you to store transmit and receive frequencies independently. Memory data can even be edited and stored on your PC. Multiple scan functions are available, including programmable band scan, memory scan with memory channel lock-out, MHz scan and call scan. For each band there are TO (time-operated), CO (carrier-operated) and seek scan resume modes. With the Memory Name function you can choose to identify each channel with up to **6 alphanumeric characters.** DTMF memory and CTCSS tone encode/decode are provided.

The TH-G71A also scores well for stamina and reliability, boasting long battery life – thanks to a variety of power-saving features – and **MIL-STD 810E** compliance for rain & shock resistance. So there's no need to go easy on this dual-bander. It's built better and brighter in every way.

- 6W (VHF), 5.5W (UHF) at 13.8V DC
- PC programmable
- 200 memory ch. with alphanumeric display
- MIL-STD 810E (rain & shock)
- CTCSS tone scan
- Wide-range coverage (incl. aircraft receive)*
- DTMF memory (10 ch. up to 16 digits)
- Multiple scan modes
- Key illumination
- High-performance antenna
- HI/LOW/EL power output selectable
- TM-V7A remote control (DTMF remote)

* *Specifications are guaranteed for Amateur Bands only*

ISO 9001
JQA-1205

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Amateur Radio Products Group
98ARD-1775

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